

Brilliant Mathematics



Teacher's Manual

KANHA BOOKS INTERNATIONAL New Delhi

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Vidyalaya Prakashan

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Class-6



Knowing Our Numbers

International system

Exercise 1.1

1. Insert commas in the correct position and write the following numbers in words in Indian and International system of numeration:

Indian system

(i)	2,13,478	213,478
(ii)	78,91,307	7,891,307
(iii)	1,53,10,241	15,310,241
(iv)	11,23,123	1,123,123
(v)	10,00,009	1,000,009
(vi)	40,07,70,008	400,770,008

2. Write the following in numeral form :

(i) 8	3,600,915	(ii) 4,052,076,000	(iii) 3,333,381
-------	-----------	--------------------	-----------------

- (iv) 10,10,680 (v) 1,07,03,042 (v) 62,37,658
- 3. Write each of the following expanded form according to Indian counting system :

(i) 3,40,31,00,277 (ii) 70,03,00,87,984

- 4. Write each of the following expanded form according to International counting system :
 - (i) 100,037,553 (ii) 76,500,030,879
- 5. 5×10×5×10000

= 50 × 50000

Product = 25,00,000



6. $7 \times 100 = 700$ 7 × 1000000 = 7000000 Difference = 7000000 - 700 = 69,99,300 7.3 8. 1 9. $9 \times 100 + 9 \times 100000$ = 900 + 900000= 9,00,90010. 1000 11. 1000 12. 10,000 13. 102 14. 98,765 15. 24 16. Difference = 4173 – 3714 = 459 17. Greatest 6 digit number = 999999 Greatest 5 digit number = 99999 Total number of 6 digit number = 999999 - 99999 = 9,00,00018. Greatest number = 9740, Smallest number = 4079 19. Write the successor of each of the following : (i) 9999 + 1 = 10,000(ii) 34,31,000 + 1 = 34,31,001(iii) 37,12,109 + 1 = 37,12,11020. Write the predecessor of each of the following : (i) 70,00,000 - 1 = 69,99,999(ii) 37,13,219 - 1 = 37,13,218(iii) 14,300 – 1 = 14299



1. Put the appropriate symbols (> or <) in each of the following boxes:



- (i) < (ii) > (iii) < (iv) <
- 2. Arrange the following numbers in ascending order:
 - (i) 181888 < 190909 < 1808088 <1808090 < 16060666
 - (ii) 45937821 < 45937823 < 45937824 < 455037251
 - (iii) 76321 < 984671 < 1834021 < 7900421 < 18431056
 - (iv) 2085249 < 4058716 < 9998215 < 353626801
- 3. Arrange the following numbers in descending order:
 - (i) 102345694 > 63547201 > 12345678 > 8354208 > 6539542
 - (ii) 304060304 > 64220305 > 8295466 > 885346
 - (iii) 286532123 > 275438952 > 2432756 > 2298654 > 289653 > 243758
- 4. Estimate the following numbers to the nearest tens :
 - (i) 630 (ii) 350 (iii) 230 (iv) 990
- 5. Estimate the following numbers to the nearest hundreds :(i) 800 (ii) 1200 (iii) 9300 (iv) 900
- 6. Estimate the following numbers to the nearest thousands :(i) 2000 (ii) 8000 (iii) 1000 (iv) 9000
- 7. Estimate the following numbers to the nearest ten thousands :
 - (i) 390000 (ii) 140000 (iii) 90000 (iv) 90000
- 8. Estimate the following numbers to the nearest lakh :
 - (i) 300000 (ii) 1800000 (iii) 2300000 (iv) 900000
- 9. Estimate the following sum to the indicated place :
 - (i) 88 estimated to nearest tens = 90
 43 estimated to nearest tens = 40
 Estimated sum = 90 + 40

(ii) 5238 estimated to nearest hundred = 5200



1570 estimated to nearest hundred = 1600
Estimated sum = 5200 + 1600
= 6800
(iii) 23567 estimated to nearest thousand = 24000
13469 estimated to nearest thousand = 13000
83847 estimated to nearest thousand = 84000

Estimated sum = 24000 + 13000 + 84000= 1,21,000

(iv) 400768 estimated to nearest thousand = 400,000 285891 estimated to nearest thousand = 2,90,000 Estimated sum = 400000 + 290000

= 6,90,000

10. Estimate the following difference to the indicated place:

- (i) 99 estimated to nearest tens = 100
 32 estimated to nearest tens = 30
 Estimated difference = 100 30 = 70
- (ii) 7359 estimated to nearest hundreds = 7400
 3232 estimated to nearest hundreds = 3200
 Estimated difference = 7400 3200

= 4200

- (iii) 58336 estimated to nearest thousands = 58000
 28389 estimated to nearest thousands = 28000
 Estimated difference = 58000 28000
 = 30000
- (iv) 400786 estimated to nearest ten thousands = 400000
 258198 estimated to nearest ten thousands = 2,60,000
 Estimated difference = 140000
- 11. Estimate the following products to the indicated place:
 - (i) 16 estimated to nearest tens = 20



39 estimated to nearest tens = 40 Estimated product = 20×40 = 800 421 estimated to nearest hundred = 400 (ii) 187 estimated to nearest hundred = 200 Estimated product = 400×200 = 80000 (iii) 760 estimated to nearest hundred = 800 160 estimated to nearest hundred = 200 Estimated product = 800×200 = 160000 (iv) 3215 estimated to nearest thousands = 3000 1893 estimated to nearest thousands = 2000 Estimated product = 3000 × 2000 = 6000000 12. Estimate the following quotients to the indicated place : 636 estimated to nearest tens = 640 (i) 23 estimated to nearest tens = 20 Estimated division = $\frac{640}{20}$ = 32 785 estimated to nearest hundreds = 800 (ii) 199 estimated to nearest hundreds = 200 Estimated division = $\frac{800}{200}$ = 4 (iii) 4489 estimated to nearest thousands = 4000 1973 estimated to nearest thousands = 2000 Estimated division = $\frac{4000}{2000}$ = 2 7 Brilliant Mathematics-6

- (iv) 123561 estimated to nearest ten thousands = 120000 59874 estimated to nearest tens thousands = 60000 Estimated division = $\frac{120000}{60000}$ = 2 Exercise-1.3
- 1. Write the Roman Numerals for : (i) 37 = 30 + 5 + 2= XXX + V + II= XXXVII (ii) 78 = 50 + 20 + 5 + 3 = L + XX + V + III= LXXVIII (iii) 89 = 50 + 30 + (10 - 1)= L + XXX + IX= LXXXIX (iv) 97 = (100 - 10) + 5 + 2= XC + V + II= XCVII 2. Write the Roman Numerals for : (i) 145 = 100 + (50 - 10) + 5= C + XL + V= CXLV(ii) 174 = 100 + 50 + 20 + (5 - 1)= C + L + XX + IV= CLXXIV(iii) 265 = 100 + 100 + 50 + 10 + 5= C + C + L + X + V= CCLXV Brilliant Mathematics-6 8

(iv)
$$387 = 100 + 100 + 100 + 50 + 30 + 5 + 2$$

= C + C + C + L + XXX + V + II
= CCCLXXXVII
Write the Roman Numerals for :
(i) $878 = 500 + 100 + 100 + 100 + 50 + 20 + 50$

3.

(i)
$$878 = 500 + 100 + 100 + 100 + 50 + 20 + 5 + 3$$

 $= D + C + C + C + L + XX + V + III$
 $= DCCCLXXVIII$
(ii) $1007 = 1000 + 5 + 2$
 $= M + V + II$
 $= MVII$
(iii) $3794 = 1000 + 1000 + 1000 + 500 + 100 + 100 + (100 - 10)$
 $+ (5 - 1)$
 $= M + M + M + D + C + C + XC + IV$
 $= MMMDCCXCIV$
(iv) $3908 = 1000 + 1000 + 1000 + (1000 - 100) + 5 + 3$
 $= M + M + M + CM + V + III$
 $= MMMCMVIII$
4. Write the Roman Numerals for :
(i) $5637 = 5000 + 500 + 100 + 30 + 5 + 2$
 $= \nabla + D + C + XXX + V + II$
 $= \nabla DCXXXVII$
(ii) $10008 = 10000 + 5 + 3$
 $= \overline{X} + V + IIII$
 $= \overline{X}VIII$
(iii) $43037 = 40000 + 3000 + 30 + 5 + 2$
 $= XL + III + XXX + V + II$
 $= \overline{X}L = TIXXXVII$
(iv) $25819 = 25000 + 500 + 300 + 10 + (10 - 1)$
 $= \overline{X}X\nabla + D + CCC + X + IX$

 $= \overline{XXV}DCCCXIX$

5. Write the following in Hindu-Arabic Numerals:

(i)
$$XC + VI = 90 + 6 = 96$$

- (ii) XX + IX = 20 + 9 = 29
- (iii) XC + IV = 90 + 4 = 94
- (iv) XC + V + II = 90 + 5 + 2 = 97
- (v) C + L + XX + II = 100 + 50 + 20 + 2 = 172
- (vi) C + C + L + IV = 100 + 100 + 50 + 4 = 254
- (vii) CD + XL + V + I = 400 + 40 + 5 + 1 = 446
- (viii) D + C + C + L + X + V + I = 500 + 100 + 100 + 50 + 10 + 5 +1 = 766

(ix)
$$D + C + C + C + L + X + I = 500 + 100 + 100 + 50 + 10 + 1$$

(x) D + C + XC + V + II = 500 + 100 + 90 + 5 + 2= 697

(xi)
$$M + C + C + XL = 1000 + 100 + 100 + 400 = 1240$$

(xiii)
$$\overline{XI}$$
 + D + C + C + C + XC + II = 11000 + 500 + 100 + 100
+100 + 90 + 2 = 11892

(xiv) \overline{VI} + CIM + XL + IX = 6000 + 900 + 40 + 9

$$= 6949$$
(xv) $\overline{LX} + X + IX = 60000 + 10 + 9$

$$= 60019$$

Exercise-1.4

 Price of books sold in the first week = `285891 Price of books sold in the second week = `400768 Price of books sold in two weeks = `285891 + `400768
 Brilliant Mathematics-6 Now,

	2	8	5	8	9	1	
+	4	0	0	7	6	8	
	6	8	6	6	5	9	

Sale in tow weeks is of `686659 Since 400768 > 285891

Sale in the second week is greater.

Difference in the sales amount = `400768 - `285891 Now,

Sale in the second week is more by `114877.

 The greatest number using the digits 6,2,7,4,3 each only once can be framed by arranging these digits in descending order.

Hence, the greatest number = 76,432

Then smallest number using the digits 6, 2, 7, 4, 3

each only once can be framed by arranging these digits in ascending order.

Hence, the smallest number = 23,467

Difference between the greatest and the smallest number is, 76,432 - 23,467 = 52,965

7 6432 -2346 7 5 2965

3. No of votes defeated candidates got = 641023

No of votes winning candidates got = 641023 + 52824



641023 + 52824 693847 Total no. of votes polled = 693847 + 641023 $\begin{smallmatrix}\textcircled{0}{6}&9&3&0\\6&9&3&8&4&7\end{smallmatrix}$ + 6 4 1 0 2 3 1 3 3 4 8 7 0 13,34,870 candidates polled in an election. 4. Total number of medicines = 200000 Weight of 1 tablet = 20 mg Total weight = 200000×20 $= 400000 \, \text{mg}$ $=\frac{40000000}{10000}g$ = 4000 g $=\frac{4\emptyset\emptyset\emptyset}{1\emptyset\emptyset\emptyset}=4$ kg 5. Let the largest number be x According to given data, smallest number = 6873547 difference between 2 numbers = 9476583 x - 6873547 = 9476583x = 9476583 + 6873547Largest number x = 163501306. Runs scored by cricket player in test matches = 6,978 Therefore, remaining runs required to complete 10,000 runs = 10,000 - 6,978 = 3,022

Thus, the player needs to score 3,022 more runs to complete 10,000 runs.





Weight of 12 bags of sugar = 58150 × 12

	5	8	1	5	0
			×	1	2
1	1	6	3	0	0
5	8	1	5	0	×
6	9	7	8	0	0

Weight of 12 bags of sugar is 697800 g.

8. It is given that each sheet makes 8 pages.

Therefore, 75000 sheets will make,

 $75000 \times 8 = 6,00,000$ pages.

Hence, no. of pages available for making notebooks is 6,00,000.

Its given that 200 pages make one notebook.

Therefore, 6,00,000 pages will make,

600000 ÷ 200 = 3000 notebooks.



Hence, 3000 notebooks can be made from the given sheets of paper.

No of candidates passed in examination = 135444
 No of candidates failed in examination = 74666
 Total candidates appeared = 135444 + 74666

210110 candidates appeared in examination.

10. Distance covered by train = 1350 km Time taken = 16 hours Speed = $\frac{\text{Distance}}{\text{Time}}$ $= \frac{1350^{675}}{36_8}$ = 84.37 km/hr11. Amount to be divided = (53100 + 25) p Total students = 25 Share of each student = $\frac{53125^{106/25^{2125}}}{25_{8_1}}$ Each student get 2125 paise *i.e.*, 21.25 12. Total quantity of milk in vessel = 4/500ml $= (4 \times 1000 + 500) \text{ ml}$ = 4500 mlCapacity of one glass = 25 ml No. of glasses that can be filled = $\frac{4500^{9/00^{180}}}{28_{8_1}}$ Thus, 180 glasses can b filled.

13. Total distance between the school and the house

= 1 km 875 m = (1000 + 875) m

= 1875 m

Total distance covered by walking both sides

Total distance covered by her in a week 3750 m × 7

Total distance covered by her is 26 km 250 m.

14. The cost of 1 table = `450 Cost of 30 tables = `450 × 30 = `13,500 Cost of 1 chair = `225 Cost of 60 chair = `225 × 60 = `13500 Total amount needed = `13,500 + `13,500 \bigcirc 1 3 5 0 0 + 1 3 5 0 0 2 7 0 0 0

27000 is needed to buy 30 tables and 60 chairs.

15. Population of a town = 975689

First year it got increase by 4563 So, population at the end of first year =

9 75689
+ 4 5 6 3
9 8 0 2 5 2

$$15$$
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Population of town = 980252

Second year it got decreased by 8976

So, population at the end of second year =

	9	8	0	2	5	2	
		_	8	9	7	6	
	9	7	1	2	7	6	_
_							

= 971276

10.

Multiple Choice Questions (MCQs)

1. (a)	2. (a)	3. (a)	4. (a)	5. (c)	6. (d)
7. (b)	8. (C)	9. (c)	10. (b)	11. (d)	12. (b)

6. Greatest 4 digit number = 9999
 Smallest 5 digit number = 10000
 Difference = 10000 - 9999

Cloth required to stitch a trouser = 1 m 25 cm = 1.25 m
 Total cloth available = 10 m

No. of trouser can be stitched = $\frac{10m \times 100}{125m} = 8$

8. No. of pages typed by Sangeeta per day = 25No. of pages typed y Sangeeta in Nov. = 25×30

$$= 750$$
Greatest 4 digit number = 9999
Greatest 3 digit number = 999
Total no. of 4 digit no. = $\frac{9999}{-999}$
 -999

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Fill in the blanks

1. 1000 2. 90000 3. 999 4. 10 5. 1000 6. 120 7. 1 8. 1000



Whole Numbers

Exercise-2.1

1. 1

- 2. 0
- 3. Write the successor of each of the following whole numbers:
 - (i) 9801 +1 = 9802
 - (ii) 10000 + 1 = 10001
 - (iii) 100909 + 1 = 100910
 - (iv) 7049999 + 1 = 7050000
 - (v) 8341929 + 1 = 8341930
 - (vi) 381808 + 1 = 381809
- 4. Write the predecessor of each of the following whole numbers:
 - (i) 100000 1 = 99999
 - (ii) 100900 1 = 100899
 - (iii) 800400 1 = 800399
 - (iv) 704999 1 = 704998
 - (v) 9801 −1 = 9800
 - (vi) 78325 1 = 78324
- 5. Represent the following numbers on the number line :



6. No. of whole numbers between 22 and 51 = (51 - 22) - 1= 28 7. 40999, 40500, 40501 8. 951000, 950999, 950998 9. (i) _____ 0 9 10 1 1 1 3 1 6 4 5 8 5 + 3 = 8(ii) — 0 1 3 4 5 9 2 1 6 7 8 10 11 10 - 4 = 6(iii) / 1 4 5 9 10 11 12 1 2 3 7 6 8 0 $6 \times 2 = 12$ (iv) ⊤ 0 1 2 3 4 9 10 11 12 13 14 15 16 8 5 67 15 - 8 = 710. Write (T) for True and (F) for False— (i) F (ii) T (iii) T (iv) F (v) F (vi) F Exercise-2.2 1. Find the sum of the following: (i) 654 + (491 + 209) = 654 + 700 = 1354 (ii) 4071 + (953 + 647) = 407 + 1600 = 2007 18 Brilliant Mathematics-6

- (iii) (1808 + 2632) + (3376 + 1024) + 2148 = (4440) + (4400) + 2148 = 10988
- 2. Find the sum of the following numbers and check the sum by the property of commutative law of addition:
 - (i) 5628 + 39784 = 45412
 5628 + 39784 = 39784 + 5628
 45412 = 45412
 Commutative law verified.
 - (ii) 14590 + 121 = 14711 14590 + 121 = 121 + 14590 14711 = 14711

Commutative law verified.

(iii) 4928 + 5172 = 10100 4928 + 5172 = 5172 + 4928 10100 = 10100

Commutative law verified.

(iv)
$$6091 + 3919 = 10010$$

 $6091 + 3919 = 3919 + 6091$
 $10010 = 10010$
Commutative law verified.

- 3. Find the sum of the following numbers and check by the associative law of addition :
 - (i) (2145 + 7955) + 5900
 10100 + 5900 = 16000
 2145 + (7955 + 5900)
 2145 + 13855 = 16000
 Associative law verified.
 - (ii) (15409 + 591) + 3221



- 16000 + 3221 = 19221
- 15409 + (591 + 3221)
- 15409 + 3812 = 19221

Associative law verified.

- 4. Fill in the blanks to get true statements:
 - (i) 2356 + 1409 = 1409 + 2356.
 - (ii) 54321 + (489 + 799) = 489 + (54321 + 799)
 - (iii) 164 + 35 + 866 = 35 + (866 + 164)
 - (iv) 1623 + (1487 + 2452) = (1623 + 1487) + 2452.
- 5. State True or False :
 - (i) T (ii) T (iii) F (iv) T (v) T



1. Find the difference of the following numbers and check your results by corresponding additions :

(i)	1 0 0 0 0 0 - 9 8 7 6 5 1 2 3 5	$ \begin{array}{c} $
(ii)	010 011 56781 -39609 17172	① ① ① 1 7 1 7 2 + 3 9 6 0 9 5 6 7 8 1
(iii)	00000000 4030201 -90725 3939476	$ \begin{array}{c} \textcircled{0} \textcircled{0} \textcircled{0} \textcircled{0} \textcircled{0} \textcircled{0} \textcircled{0} 0$
(iv)	491491391 5050501 -96969696 4080805	$ \bigcirc \bigcirc$
		20 Brilliant Mathematics-6

- Greatest 4 digit number = 9999
 Smallest 4 digit number = 1000
 Difference = 9999 1000

- 4. Find the missing number in each of the followings :
 - (i) x 2317 = 3510x = 3510 + 2317 $\begin{array}{r} 3 & 5 & 1 & 0\\ + & 2 & 3 & 1 & 7\\ \hline & 5 & 8 & 2 & 7 \end{array}$

(ii)
$$9696 - x = 966$$

 $x = 9696 - 966$

8)(16)		
9	6	9	6	
	9	6	6	
8	7	3	0	

(iii)
$$40000 - x = 301202$$

 $x = 400000 - 301202$
 $3 \odot \odot \odot \odot \odot \odot \odot$
 $4 0 0 0 0 0 0$
 $-3 0 1 2 0 2$
 $9 8 7 9 8$
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5. *a* = 7423 *b* = 2536 a-b = 7423 - 2536= 4887 b-a 2536 - 7423 = -4887 4887 -4887 Hence verified. 6. *a* = 99 b = 43 c = 25 $(a - b) - c \quad a - (b - c)$ (99 - 43) - 25 99 - (43 - 25) 56 - 25 99 - 18 31 81 Hence verified 7. Quantity of milk vendor supplies in morning = 32/ Total quantity of milk vendor supplies = 100/ Quantity of milk vendor supplies in evening = 100/ - 32/= 68/ 8. Quintal of onions in a godown = 10795 Quintal of onions sold in first week = 5840 Quintal of onions sold in second week = 4290 Total onion sold = 5840 + 42905840 + 4 2 9 0 10130 Quintal of onions left = 10795 – 10130 10 795 -10130 665 Brilliant Mathematics-6 22

665 quintals of onions were left.

9. Amount deposited in bank account = `25000 Total withdrawl amount = `2845 + `3147 + `6875

	\bigcirc	1	\bigcirc	
	2	8	4	5
	3	1	4	7
+	6	8	7	5
1	2	8	6	7

Amount left in his account = 25000 - 12867

@ @ @ 25000/)1) ′ /
-1286	7
12133	

`12133 left in his account.

10. Sum of two number 896432 One number = 523677

Second number = 896432 - 523677

			6	13	12	12	
	8	9	К	Å	X	Z	
_	5	2	3	6	7	7	
	3	7	2	7	5	5	

Second number 372755

Exercise-2.4

1. Fill in the blanks to make these statements true:

(i)
$$371 \times 0 = 0$$
 (ii) $237 \times 113 = 113 \times 237$

- (iii) 4817 × 1 = 4817 (iv) 9080 × 1 = 9080
- (v) $79 \times (37 + 21) = 79 \times 37 + 21 \times 21$
- (vi) $37 \times 18 = 37 \times 9 + 37 \times 4 + 37 \times 5$



- 2. By suitable re-arrangement, find the product:
 - (i) $(4 \times 25) \times 2196$

 $= 100 \times 2196 = 219600$

- (ii) $(625 \times 16) \times 495$
 - $= 10000 \times 495 = 4950000$
- (iii) $(50 \times 20)(3925 \times 9)$ = 1000 × (35325) = 35325000
- (iv) $(50 \times 2) \times 1497$ = 100 × 1497 = 149700
- 3. By using distributive property of multiplication, find the product:
 - (i) 84 × (20 + 1) = 1680 + 84 = 1764
 - (ii) $45 \times (1000 1)$ = 45000 - 45 = 44955
 - (iii) 220 × (1000 + 35) = 220000 + 7700 = 227700
 - (iv) 736 × (100 + 3)
 - = 73600 + 2208 = 75808
 - (v) 258 × (1000 + 8)
 - = 258000 + 2064 = 260064
- 4. Find the values of each of the following using properties :
 - (i) 943(8 + 2) = 943 × 10 = 9430
 - (ii) 25749 × (93 + 7)
 - = 25749×100 = 2574900
 - (iii) 12345(167 52 15)

(iv) 3120(693 – 593)

= 3120(100) = 312000



5. Determine the product of Greatest 4 digit number = 9999 (i) Smallest 2 digit number = 10 $Product = 9999 \times 10$ = 99990 (ii) Greatest 5 digit number = 99999 Greatest 3 digit number = 999 Product = 99999 × 999 = 9999(1000 - 1)= 99999000 - 99999 = 99899001 6. a = 8, b = 12, c = 38 $a \times (b + c) = a \times b + a \times c$ $8 \times (12 + 8) = 8 \times 12 + 8 \times 8$ $8 \times (20) = 96 + 64$ 160 = 160Hence verified 7. No. of Maths books = 132 No. of Science books = 132 Cost of 1 Maths books = 279 Cost of 132 Maths books = 132 × 279 =`36828 Cost of 1 Science book = 297 Cost of 132 Science books = 132 × 297 = 39204 Amount he paid = ` (36828 + 39204) 0 0 036828 + 3 9 2 0 4 76032 Brilliant Mathematics-6 25

He paid ` 76032 for these books.

 Cost of a chair = `480 Cost of 450 chairs = `480 × 450

=`216000

- Cost of a table = `520
- Cost of 450 tables = 520×450

=`234000

Total =` (216000 + 234000) ① 216000

+	+234000	
	450000	

He paid ` 450000.

9. Annual fee of a students = `8384 Total no. of students = 235 Total collection = `8384 × 235 8 3 8 4 $\frac{2 3 5}{4 1 9 2 0}$ $2 5 1 5 2 \times$ $1 6 7 6 8 \times \times$ 1 9 7 0 2 4 0

Total collection = `1970240

10. Quantity of petrol filled on Monday = 22IQuantity of petrol filled on Wednesday = 40IQuantity of petrol filled on Friday = 28ITotal petrol filled = 22I + 40I + 28I = 90ICost of 1I petrol = `98 Cost of 90I petrol = `98 × 90= `98 × (100 - 10) = `9800 - 980 = `8820 26 Brilliant Mathematics-6 Exercise-2.5

1. Fill in the blanks :

(i)

(i)	23457 ÷1 = 23457	(ii) $0 \div 97 = 0$	
(iii)	15341 ÷ 1 = 15341	(iv) 3 × 4 = 12	12 ÷ 4 = 3

2. Divide and check the result by division algorithm :



Quotient = 1504 Remainder = 20 Verification Dividend = Divisor × Quotient + Remainder 88756 = 59 × 1504 + 20 = 88736 + 20 = 88756 (ii) 197 35) 6906 35 340 -315, 256 -245 11 Quotient = 197 Remainder = 11 Verification 27







(i) 263 23) 6049 ($-46 \downarrow$ 144 $-138 \downarrow$ 69 -69 0	Check (1) $2 \ 6 \ 3$ $\times \ 2 \ 3$ $1 \ 7 \ 8 \ 9$ $5 \ 2 \ 6 \ \times$ $6 \ 0 \ 4 \ 9$				
(ii) 49 239) 11711 ($-956 \downarrow$ 2151 -2151 0	Check $(3) (8) (2 \ 3 \ 9) (2 \ 1 \ 5 \ 1) (2 \ 1 \ 5 \ 1) (2 \ 1 \ 5 \ 1) (2 \ 1 \ 1 \ 7 \ 1 \ 1) (2 \ 1 \ 1 \ 1) (2 \ 1) (2 \ 1 \ 1) (2 \ 1$				
(iii) $\begin{array}{c} 250 \\ 139 \end{array}) \begin{array}{c} 34750 \\ -278 \downarrow \\ 695 \\ -695 \downarrow \\ 00 \\ \hline \\ 0 \\ \hline \\ \end{array}$	Check $\begin{array}{c} 2 & 5 & 0 \\ \times & 1 & 3 & 9 \\ \hline 2 & 2 & 5 & 0 \\ 7 & 5 & 0 & \times \\ \hline 2 & 5 & 0 & \times \\ \hline 3 & 4 & 7 & 5 & 0 \end{array}$				
$ \begin{array}{r} 262 \\ 175 \overline{\smash{\big)}} 45850 \\ -350 \overline{} \\ 1085 \\ -1050 \overline{} \\ 350 \\ -350 \\ 0 \\ \end{array} $	Check $3 (1)$ 2 6 2 $\times 1 7 5$ 1 3 1 0 $1 8 3 4 \times$ $2 6 2 \times \times$ 4 5 8 5 0 Authematics 6				

3. Divide and check the result by corresponding multiplication:

4.

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Remainder = 9 7. Dividend = Divisor × Quotient + Remainder $= 46 \times 11 + 18$ = 506 + 18 = 524 8. Product of two numbers = 504347 <u>15</u>91 One number = 317 317) 504347 (<u>-317↓</u> 1873 Other number = x $317 \times x = 504347$ -<u>1585</u> 2884 $x = \frac{504347}{317}$ <u>-2853</u> 317 Other number = 1591 -317 0

9. Dividend = Divisor × Quotient + Remainder

 $55390 = 185 \times Q + 75$ $\frac{55390}{185} = Q + 75$

$$\begin{array}{r} 299 \\
185) 55390 (\\
-370 \\
1839 \\
-1665 \\
1740 \\
-1665 \\
75 \\
\end{array}$$

Quotient = 299
10. Price of 178 cars =
$$^{2}43752400$$

Price of 1 car = $\frac{43752400}{178}$
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Multiple Choice Questions (MCQs)

1. (a)	2. (b)	3. (b)	4. (c)	5. (d)	6. (a)
7. (c)	8. (a)	9. (c)	10. (d)	11. (c)	12. (a)

- 3. 1 0 = 1
- 4. 736 × (100 7)
 - = 73600 5152
 - = 68448
- 9. Dividend = Divisor × Quotient + Remainder
 - $= 9 \times 307 + 29$
 - = 2763 + 29
 - = 2792

Fill in the blanks

1. One 2.899 3.1 4.05. addition, multiplication 6.0 7. 24 8.1



Exercise 3.1

1. Write all factors of the following number:

(i)
$$1 \times 24 = 24$$

 $2 \times 12 = 24$
 $3 \times 8 = 24$
 $4 \times 6 = 24$
Factor of 24 = 1, 2, 3, 4, 6, 8, 12, 24



(ii) $1 \times 54 = 54$ $2 \times 27 = 54$ $3 \times 18 = 54$ $6 \times 9 = 54$ Factor of 54 = 1, 2, 3, 6, 9, 18, 27, 54 (iii) $1 \times 84 = 84$ $2 \times 42 = 84$ 3 × 28 = 84 4 × 21 = 84 $6 \times 14 = 84$ $7 \times 12 = 84$ Factor of 84 = 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84 (iv) $1 \times 125 = 125$ 5 × 25 = 125 Factors of 125 = 1, 5, 25, 125 (v) $1 \times 220 = 220$ $2 \times 110 = 220$ $4 \times 55 = 220$ $5 \times 44 = 220$ $10 \times 22 = 220$ $11 \times 20 = 220$ Factors of 220 = 1, 2, 4, 5, 10, 11, 20, 22, 44, 55, 110, 220 (vi) $1 \times 360 = 360$ 2×180 = 360 $3 \times 120 = 360$ $4 \times 90 = 360$ $5 \times 72 = 360$ $6 \times 60 = 360$ Brilliant Mathematics-6 34



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Factors of 1200 = 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 16, 20, 24, 25, 30, 40, 48, 50, 60, 75, 80, 100, 120, 150.

- 2. Write down first five multiples of :
 - (i) First five multiples of 6
 6 × 1, 6 × 2, 6 × 3, 6 × 4, 6 × 5
 6, 12, 18, 24, 30
 - (ii) First five multiples of 11
 11 × 1, 11 × 2, 11 × 3, 11 × 4, 11 × 5
 11, 22, 33, 44, 55
 - (iii) First five multiples of 15
 15 × 1, 15 × 2, 15 × 3, 15 × 4, 15 × 5
 15, 30, 45, 60, 75
 - (iv) First five multiples of 18
 18 × 1, 18 × 2, 18 × 3, 18 × 4, 18 × 5
 18, 36, 54, 72, 90
 - (v) First five multiples of 32
 32 × 1, 32 × 2, 32 × 3, 32 × 4, 32 × 5
 32, 64, 96, 128, 150
 - (vi) First five multiples of 81
 81 × 1, 81 × 2, 81 × 3, 81 × 4, 81 × 5
 81, 162, 243, 324, 405
 - (vii) First five multiples of 90
 90 × 1, 90 × 2, 90 × 3, 90 × 4, 90 × 5
 90, 180, 270, 360, 450
 - (viii) First five multiples of 120 120 × 1, 120 × 2, 120 × 3, 120 × 4, 120 × 5 120, 240, 360, 480, 600


- 3. Write all the prime numbers between the given numbers:
 - (i) 2, 3, 5, 7 (ii) 31, 37, 41, 43 (iii) 83, 89, 97 (iv) 127, 131, 137, 139, 149
- 4. Express each of the following even numbers as the sum of two odd numbers:

(i) 3 + 9 (ii) 3 + 33 (iii) 5 + 37 (iv) 25 + 119

5. Express each of the following numbers as the sum of prime numbers:

(i) 2 + 47 (ii) 2 + 61 (iii) 5 + 73 (iv) 2 + 97

- 6. Which of the following pairs are co-prime?
 - (i) Factors of 18 = 1, 2, 3, 6, 9, 18
 Factors of 35 = 1, 5, 7, 35
 common factors = 1
 18, 35 are co-prime.
 - (ii) Factors of 27 = 1, 3, 9, 27
 Factors of 36 = 1, 2, 3, 4, 6, 9, 12, 18, 36
 Common factors = 1, 3, 9
 21, 36 are not co-prime.
 - (iii) Factors of 10 = 1, 2, 5, 10
 Factors of 21 = 1, 3, 7, 21
 Common factors = 1
 10, 21 are co-prime.
 - (iv) Factors of 11 =1, 11
 Factors of 36 = 1, 2, 3, 4, 6, 9, 12, 18, 36
 Common factors = 1
 11, 36 are co-prime.
- 7. Factors of 28 = 1, 2, 4, 7, 14, 28



Sum = 2 × 28 28 is a perfect number.

- 8. Factors of 1701 = 1, 3, 7, 9, 21, 27, 63, 81, 189, 243, 567, 1701
 Factors of 4400 = 1, 2, 4, 5, 8, 10, 11, 16, 20, 22, 25, 40, 50, 55, 80, 88, 100, 110, 176, 200, 220, 275, 400, 440, 550, 880, 1100, 2200, 4400.
 Common factors = 1
 Hence, 1701 and 4400 are co-prime.
- 9. Test the divisibility of the following numbers by 2:
 - (i) Number ends in 0.So, 5620 is divisible by 2.
 - (ii) Number ends in 5So, 364325 is not divisible by 2.
 - (iii) Number ends in 6 So, 87646 is divisible by 2.
 - (iv) Number ends in 4 So, 9876354 is divisible by 2.
- 10. Test the divisibility of the following numbers by 3:
 - (i) Sum = 4 + 3 + 7 + 1 = 15
 15 is divisible by 3
 So, 4371 is divisible by 3.
 - (ii) Sum = 5 + 0 + 3 + 9 + 1 = 18
 18 is divisible by 3
 So, 50391 is divisible by 3.
 - (iii) Sum = 9 + 4 + 7 + 5 + 4 + 1 = 30
 30 is divisible by 3
 So, 947541 is divisible by 3.
 - (iv) Sum = 1 + 0 + 0 + 5 + 3 + 2 = 11 11 is not divisible by 3



So, 100532 is not divisible by 3.

- 11. Test the divisibility of the following numbers by 4:
 - Number formed by last two digits = 32
 Clearly 32 is divisible by 4
 So, 786532 is divisible by 4.
 - (ii) Number formed by last two digits = 55Clearly 55 is not divisible by 4So, 37255 is not divisible by 4.
 - (iii) Number formed by last two digits = 00Clearly 00 is divisible by 4So, 83500 is divisible by 4.
 - (iv) Number formed by last two digits = 48Clearly 48 is divisible by 4So, 5248 is divisible by 4.
- 12. Test the divisibility of the following numbers by 5:
 - (i) Number ends in 0So, 7240 is divisible by 5.
 - (ii) Number ends in 2
 - So, 36712 is not divisible by 5.
 - (iii) Number ends in 5So, 42515 is divisible by 5.
 - (iv) Number ends in 0So, 732510 is divisible by 5.
- 13. Test the divisibility of the following numbers by 6:
 - (i) Number ends in 8, so it is divisible by 2 Sum = 1 + 3 + 3 + 8 = 15, is divisible by 3 So, 1338 is divisible by 6.
 - (ii) Number ends in 0, so it is divisible by 2. Sum = 7 + 0 + 2 + 0 = 9, is divisible by 3



So, 7020 is divisible by 6.

(iii) Number ends in 3, so it is not divisible by 2 So, 89743 is not divisible by 6. (iv) Number ends in 2, so it is divisible by 2 Sum = 2 + 5 + 5 + 1 + 2 = 15, is divisible by 3 So, 25512 is divisible by 6. 14. Test the divisibility of the following numbers by 7 : (i) Last digit = 5 $= 5 \times 2 = 10$ Number formed by remaining digit = 66Difference = 66 - 10= 56 which is multiple of 7 So, 665 is divisible by 7 Last digit = 2 (ii) $= 2 \times 2 = 4$ Number formed by remaining digit = 151 Difference = 151 - 4= 147 which is multiple of 7 So, 1512 is divisible by 7 (iii) Last digit = 3 $= 2 \times 3 = 6$ Number formed by remaining digit = 8974 Difference = 8974 - 6= 8968 which is not multiple of 7. So, 89743 is not divisible by 7. (iv) Last digit = 7 $= 7 \times 2 = 14$ Number formed by remaining digit = 5491 Difference = 5491 - 1440 Brilliant Mathematics-6

= 5477 which is not multiple of 7

So, 5491 is not divisible by 7.

- 15. Test the divisibility of the following numbers by 8:
 - Number formed by last three digit = 724
 Clearly 724 is not divisible by 8
 So, 3724 is not divisible by 8.
 - (ii) Number formed by last three digit = 314Clearly 314 is not divisible by 8So, 7314 is not divisible by 8.
 - (iii) Number formed by last three digit = 000 Clearly 000 is divisible by 8.So, 6000 is divisible by 8.
 - (iv) Number formed by last three digit = 344Clearly 344 is divisible by 8.So, 42344 is divisible by 8.
- 16. Test the divisibility of the following numbers by 9:
 - (i) Sum = 3 + 4 + 7 + 8

= 21 which is not divisible by 9

So, 3478 is not divisible by 9

(ii) Sum = 2 + 8 + 2 + 5 + 7 + 3= 27 which is divisible by 9

So, 282573 is divisible by 9.

(iii) Sum = 1 + 2 + 3 + 4 + 5 + 4= 19 which is not divisible by 9

So, 123454 is not divisible by 9.

(iv) Sum = 5 + 4 + 7 + 2 + 1 + 8

= 27 which is divisible by 9

So, 547218 is divisible by 9.



17. Test the divisibility of the following numbers by 10: Number ends in 2 so, 4892 is not divisible by 10 (i) (ii) Number ends in 0 so, 67890 is divisible by 10. (iii) Number ends in 0 so, 10000 is divisible by 10 (iv) Number ends in 7 so, 920517 is not divisible by 10. 18. Test the divisibility of the following numbers by 11: Sum of digits in odd places = 8 + 3 = 11(i) Sum of digits in even places = 7 + 4 = 11Difference = 11 - 11= 0 which is divisible by 11 So, 8734 is divisible by 11. (ii) Sum of digits in odd places = 1 + 5 + 4 = 10Sum of digits in even places = 3 + 7 = 10Difference = 10 - 10= 0 which is divisible by 11 So, 13574 is divisible by 11 (iii) Sum of digits in odd places = 9 + 4 + 6 = 19Sum of digits in even places = 2 + 5 = 7Difference = 19 - 7= 12 which is not divisible by 11 So, 92456 is not divisible by 11. (iv) Sum of digits in odd places = 1 + 7 + 8 = 16Sum of digits in even places = 0 + 7 + 9 = 16Difference = 16 - 16 = 0 which is divisible by 11 So, 107789 is divisible by 11. 19. Fill in the smallest digit in the blank space so that: 1 + 5 + 6 + x + 9 is divisible by 3 (i) 21 + x is divisible by 3 0 is divisible by 3

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X = 0(ii) 8 + 1 + 5 + x + 3 is divisible by 9 17 + x is divisible by 9 17 + 1 is divisible by 9 x = 1(iii) 7 + 8 + 3 + x + 2 is divisible by 2 7 + 8 + 3 + x + 2 is divisible by 3 20 + x is divisible by 3 20+1 is divisible by 3 x = 1(iv) Sum of digits at odd place = 2 + x + 7 = 9 + xSum of digits at even place = 8 + 2 = 10Difference = $\frac{(9 + x - 10)}{11}$ = $\frac{(10 - 10)}{11}$ = 0 is divisible by 11 So, x = 120. (2, 3) (3, 7) (4, 9) (4, 15) (5, 6)

Exercise-3.2

1. Find the prime factorization of each of the following:

(i)

2	160		
2	80		
2	40		
2	20		
2	10		
5	5		
	1		

Factorization of $160 = 2 \times 2 \times 2 \times 2 \times 2 \times 5$



$$\begin{array}{c|cccc}
2 & 216 \\
\hline
2 & 108 \\
\hline
2 & 54 \\
\hline
3 & 27 \\
\hline
3 & 9 \\
\hline
3 & 3 \\
\hline
& 1 \\
\end{array}$$

Factorization of 216 = $2 \times 2 \times 2 \times 3 \times 3 \times 3$

(iii)

(ii)

5	425
5	85
17	17
	1

Factorization of $425 = 5 \times 5 \times 17$

(iv)

3	999
3	333
3	111
37	37
	1

Factorization of 999 = $3 \times 3 \times 3 \times 37$

(v)

2	2448
2	1224
2	612
2	306
3	153
3	51
17	17
	1

Factorization of 2448 = $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 17$



(vi)

2	9282
3	4641
7	1547
13	221
17	17
	1

Factorization of 9282 = $2 \times 3 \times 7 \times 13 \times 17$

(vii)

2	1024
2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

(viii)

3	99999
3	33333
41	11111
271	271
	1

Factorization of 99999 = $3 \times 3 \times 41 \times 271$

2. Smallest 5 digit number = 10000



2	10000
2	5000
2	2500
2	1250
5	625
5	125
5	25
5	5
	1

Factorization = $2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5$

3. Fill up the factor tree using prime numbers:



4. Write the common factors of :

- (i) Factors of 35 = 1, 5, 7, 35
 Factors of 60 = 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60
 Common factors = 1, 5
- (ii) Factors of 50 = 1, 2, 5, 10, 25, 50
 Factors of 120 = 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60, 120
 Common factors = 1, 2, 5, 10
- (iii) Factors of 4 = 1, 2, 4Factors of 8 = 1, 2, 4, 8Factors of 12 = 1, 2, 3, 4, 6, 12Common factors = 1, 2, 4



- (iv) Factors of 6 = 1, 2, 3, 6
 Factors of 12 = 1, 2, 3, 4, 6, 12
 Factors of 36 = 1, 2, 3, 4, 6, 9, 12, 18, 36
 Common factors = 1, 2, 3, 6
- 5. Find the HCF of the following by prime factorization:

(i)	2	36		2	84
	2	18		2	42
	3	9		3	21
	3	3		7	7
		1	-		1

Prime factors of $36 = 2 \times 2 \times 3 \times 3$

Prime factors of $84 = 2 \times 2 \times 3 \times 7$

Common factors = $2 \times 2 \times 3$

HCF = 12

(ii)	2	108		2	144
	2	54		2	72
	3	27		2	36
	3	9		2	18
	3	3		3	9
		1	-	3	3
		•			1

Prime factors of $108 = 2 \times 2 \times 3 \times 3 \times 3$ Prime factors of $144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$

Common factors $= 2 \times 2 \times 3 \times 3$

HCF = 36

(iii)	5	525		5	675
	5	105		5	135
	3	21		3	27
	7	7		3	9
		1		3	3
			-		1



Prime factors of $525 = 5 \times 5 \times 3 \times 7$ Prime factors of $675 = 5 \times 5 \times 3 \times 3 \times 3$ Common factors = $5 \times 5 \times 3$ HCF = 75

(iv)	2	54		2	120
	3	27	_	2	60
	3	9		2	30
	3	3		3	15
		1		5	5
					1

2	198
3	99
3	33
11	11
	1

Prime factors of $54 = 2 \times 3 \times 3 \times 3$ Prime factors of $120 = 2 \times 2 \times 2 \times 3 \times 5$ Prime factors of $198 = 2 \times 3 \times 3 \times 11$ Common factors = 2×3 HCF = 6

(v)	2	14		2	42		2	82
	7	7	-	3	21	_	41	41
		1	-	7	7			1
					1			

Prime factors of $14 = 2 \times 7$ Prime factors of $42 = 2 \times 3 \times 7$ Prime factors of $82 = 2 \times 41$ Common factors = 2 HCF = 2(vi) 2 | 96 2 2 2 2 2 2 2 2 2 2 2 48 2 24

12

6 3

1

2

2

3

128		2	3
64		2	1
32		3	
16		3	
8			
4	_		
2	-		

6 8 9 3 1



1

Prime factors of $96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$ Prime factors of $128 = 2 \times 2$ Prime factors of $36 = 2 \times 2 \times 3 \times 3$ Common factors $= 2 \times 2$ HCF = 4

6. Find the HCF of the following by division method:

-<u>2628</u> 0



(iv) 1197) 1311 (1 - 1197 57) 627 (11 <u>-627</u> 0 114) 1197 (10 -1140 57) 114 (2 <u>-114</u> 0 HCF = 57 (v) 180) <u>252</u> (1 - 180 36) 324 (9 $\frac{-324}{0}$ 180 (2 72) <u>-144</u> 36) 72 (2 <u>-72</u> 0 HCF = 36(vi) 575) <u>1225 (</u>2 - <u>1150</u> 75) 57 25) 625 (25 -625 676 77

HCF = 25

7. Find the LCM of the following prime factorization:

(i)	2	40	2	48	3	45
	2	20	2	24	3	15
	2	10	2	12	5	5
	5	5	2	6		1
		1	3	3		
				1		
			_			

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40 =	2×2>	× 2 × 5					
48 =	2×2>	× 2 × 2 × 3					
$45 = 3 \times 3 \times 5$							
$LCM = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$							
	= 720	0					
(ii)	7	49	2	126			
	7	7	3	63			
		1	3	21			
			7	7			
				1			

$$49 = 7 \times 7$$

$$126 = 2 \times 3 \times 3 \times 7$$

$$LCM = 7 \times 7 \times 3 \times 3 \times 2$$

$$= 882$$
(iii)
$$\frac{2 | 42}{3 | 21} = \frac{2}{2}$$

42	2	56	_	3	63
21	2	28		3	21
7	2	14		7	7
1	7	7			1
		1	-		

2	184
2	92
2	46
23	23
	1

 $46 = 2 \times 23$



69 = 3	3×23	3			
184 =	2×2	2 × 2 × 23			
LCM	= 2 ×	2×2×2	3×3		
	= 552	2			
(v)	3	81		2	126
	3	27		3	63
	3	9		3	21
-	3	3	· ·	7	7
-		1			1

26	2	252	
3	2	126	
21	3	63	
7	3	21	
1	7	7	
		1	

$$81 = 3 \times 3 \times 3 \times 3$$
$$126 = 2 \times 3 \times 3 \times 7$$
$$252 = 2 \times 2 \times 3 \times 3 \times 7$$
$$LCM = 3 \times 3 \times 3 \times 3 \times 2 \times 2 \times 7$$
$$= 2268$$

(vi)	2	42	2	56	_ 2	112	2	126
	3	21	2	28	2	56	3	63
	7	7	2	14	2	28	3	21
		1	7	7	2	14	7	7
				1	7	7		1
						1		

$$42 = 2 \times 3 \times 7$$

$$56 = 2 \times 2 \times 2 \times 7$$

$$112 = 2 \times 2 \times 2 \times 2 \times 7$$

$$126 = 2 \times 3 \times 3 \times 7$$

$$LCM = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 7$$

$$= 1008$$

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o. This the control the following by division method	8.	Find the LCM	of the	following	by	division	method
--	----	--------------	--------	-----------	----	----------	--------

(i)	7	49.	63.	84		<i></i>	
(1)	3	7.	9,	12			
	7	7,	3,	4			
	3	1,	3,	4			
	2	1,	1,	4			
	2	1,	1,	2			
		1,	1,	1			
		Л = 7	×3×	7×3	×2×	2	
		= 1	764		_	-	
(ii)	2	20,	36,	60			
()	2	10,	18,	30			
	5	5,	9,	15			
	3	1,	9,	3			
	3	1,	3,	1			
		1,	1,	1			
	LCN	Л = 2	×2×	5 × 3	× 3		
		= 18	30				
(iii)	3	93	, 12	2493			
	13	31	, 12	2493			
	31	31	1	961			
	31	1	1	31			
		1	,	1			
	LCN	√l = 3	×13>	< 31 ×	31		
		= 3	7479				
(iv)	2	18,	24,	42,	54,	60	
	3	9,	12,	21,	27,	30	
	3	3,	4,	7,	9,	10	
	2	1,	4,		3,	10	_
	2	1,	2,		3,	5	
	/	1,	1,	1,	3,	5	
	3 Г	, 	1,	, 1	<u>პ,</u> ₁	5	
	5	, 1	1,	1, 1	, 1	5	
		Ι,	Ι,	Ι,	Ι,	I	



		1 2		າາ.		72	. 5 7	
(λ)	LUN 5	vi = Z 1 30	× 3 × . 4()	3×2: 70	× Z × 45	7 × 3 60	x ɔ = /: 65	000
(v)	2	6.	8,	14.	9.	12.	13	
	3	3,	4,	7,	9,	12,	13	
	2	1,	4,	7,	3,	4,	13	
	2	1,	2,	7,	3,	2,	13	
	3	1,	1,	7,	3,	1,	13	
	7	1,	1,	7,	1,	1,	13	
	13	1,	1,	1,	1,	1,	13	
		1,	1,	1,	1,	1,	1	
	LCN	√l = 5	×2×	3×2	×2×	3×7	×13	
		= 3	2760					
(vi)	2	= 3. 60,	2760 70,	108				
(vi)	2	= 3 60, 30,	2760 70, 35,	108 54				
(vi)	2 2 3	= 3 60, 30, 15,	2760 70, 35, 35,	108 54 27				
(vi)	2 2 3 3	= 3. 60, 30, 15, 5,	2760 70, 35, 35, 35,	108 54 27 9				
(vi)	2 2 3 3 3	= 3 60, 30, 15, 5, 5,	2760 70, 35, 35, 35, 35,	108 54 27 9 3				
(vi)	2 2 3 3 3 5	= 3 60, 30, 15, 5, 5, 5,	2760 70, 35, 35, 35, 35, 35,	108 54 27 9 3 1				
(vi)	2 3 3 3 5 7	= 3 60, 30, 15, 5, 5, 5, 1,	2760 70, 35, 35, 35, 35, 35, 7,	108 54 27 9 3 1 1				
(vi)	2 3 3 5 7	= 3. 60, 30, 15, 5, 5, 5, 1, 1,	2760 70, 35, 35, 35, 35, 35, 7, 1,	108 54 27 9 3 1 1 1				
(vi)	2 2 3 3 5 7 LCN	= 3. 60, 30, 15, 5, 5, 1, 1, 1, √I = 2	2760 70, 35, 35, 35, 35, 35, 7, 1, × 2×	108 54 27 9 3 1 1 1 3 × 3	 × 3 ×	5×7		
(vi)	2 2 3 3 3 5 7 LCN	= 3. 60, 30, 15, 5, 5, 5, 1, 1, $M = 2 = 3 $	2760 70, 35, 35, 35, 35, 35, 7, 1, × 2 × 780	108 54 27 9 3 1 1 1 3 × 3	 × 3 ×	5×7		

9. Largest number which divides 856 and 936 leaving no remainder is HCF of 856 and 936

$$\begin{array}{r}
856) & 936 & (1) \\
 - 856 \\
 80) & 856 & (10) \\
 --800 \\
 56) & 80 & (1) \\
 --56 \\
 24) & 56 & (2) \\
 -48 \\
 8) & 24 & (3) \\
 -24 \\
 \hline
 x \\
 \hline
 54 \\
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\end{array}$$

8 is largest number which on dividing 856 and 936 leaves no remainder.

10. The required number would be HCF of

$$(400 - 9), (435 - 10) \text{ and } (541 - 14).$$

 $391 = 17 \times 23$
 $425 = 5 \times 5 \times 17$
 $527 = 17 \times 31$

Required HCF = 17 11. 2011 - 9 = 2002

2623 – 5 = 2618

So, the required greatest number will be HCF of 2002 and 2618 $\,$

$$2002) \begin{array}{r} 2618 (1) \\ -2002 \\ \hline 616) 2002 (3) \\ -1848 \\ \hline 154) 616 (4) \\ -616 \\ \hline \times \end{array}$$

12. So find the greatest number exactly divisible by 12,16, 20 and 24

2	12,	16,	20,	24	
2	6,	8,	10,	12	
2	3,	4,	5,	6	_
2	3,	2,	5,	3	
3	3,	1,	5,	3	
5	1,	1,	5,	1	
	1,	1,	1,	1	
LCIV	$1 = 2 \times 2$	2×2>	< 2 × 3	×5	
	= 48	× 5			
	= 240)			
				<	55 Brilliant Mathematics-6

Greatest no. of 4 digits = 9999 When 9999 is divided by 240 we get 159 as remainder. Greatest 4 digit number divisible by 12, 16, 20 and 24 = 9999 - 159

= 9999 - 10

= 9840

13. To find the least 4-digit numbers divided by 6, 9, 12, 18

2	6,	9,	12,	18
3	3,	9,	6,	9
3	1,	3,	2,	3
2	1,	1,	2,	1
	1,	1,	1,	1

 $LCM = 2 \times 3 \times 3 \times 2 = 36$

Least 4 digit number = 1000

Least 4 digit number when divided by 36 gives remainder

i.e.,
$$\frac{1000}{36}$$
 i.e., 28 as remainder

So, number divisible by

6, 9, 12, 18 = 1000 + (36 – 28) = 1008

Since number leaves remainder as

= 1008 + 3 = 1011

14. <u>3 | 15, 18, 25,</u> 30 2 25, 5, 6, 10 3 5, 3, 25, 5 5 5, 25, 1, 5 5 1, 1, 5, 1 1, 1, 1, 1 $LCM = 3 \times 2 \times 3 \times 5 \times 5$ = 450





8400 = 8400

Hence Verified.



(ii)	2	6	_	2	48
	3	3		2	24
		1		2	12
				2	6
				3	3

1

 $6 = 2 \times 3$ $48 = 2 \times 2 \times 2 \times 2 \times 3$ CF = 2, 3HCF = $2 \times 3 = 6$ $LCM = 2 \times 2 \times 2 \times 2 \times 3$ = 48 LCM × HCF = Product of two numbers $48 \times 6 = 6 \times 48$ 288 = 288 Hence verified. 2 | 300 2 | 450 2 150 5 225 3 75 5 45 5 3 25 9 5 5 3 3 1 1 $300 = 2 \times 2 \times 3 \times 5 \times 5$ $450 = 2 \times 5 \times 5 \times 3 \times 3$ CF = 2, 3, 5, 5 $HCF = 2 \times 3 \times 5 \times 5 = 150$ $LCM = 2 \times 2 \times 3 \times 3 \times 5 \times 5 = 900$ HCF × LCM = Product of two numbers $150 \times 900 = 300 \times 450$ 135000 = 135000 Brilliant Mathematics-6 58

(iii)

(iv)	2	576		2	720
	2	288		2	360
	2	144		2	180
	2	72		3	90
	2	36		3	30
	2	18		2	10
	3	9		5	5
	3	3	-		1
		1			

 $576 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$ $720 = 2 \times 2 \times 2 \times 3 \times 3 \times 2 \times 5$ CF = 2, 2, 2, 2, 3, 3 $HCF = 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 144$ $LCM = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 2880$ HCF × LCM = Product of two numbers $144 \times 2880 = 576 \times 720$ 414720 = 417420 Hence verified.

16. HCF = 18

LCM = 504First number = 72 HCF × LCM = Product of two numbers $18 \times 504 = 72 \times x$ $\frac{18 \times 504}{72} = x$ $x = \frac{18^{9^{2}} \times 504^{252^{126}}}{72_{36_{421}}}$ = 126

Second number = 126



17. Product of two numbers = 4800

LCM = ?HCF = 24HCF × LCM = Product of two numbers $24 \times LCM = 4800$ $LCM = \frac{4800^{2400^{1200^{200}}}}{24_{V_{201}}} = 200$ 18. Given : HCF = 12 LCM = 64To find : Can there be two numbers with HCF and LCM 64? Let the two numbers be *a* and *b* $a \times b = HCF \times LCM$ $= 12 \times 64$ = 768 $768 = 2 \times 3$ $12 = 2 \times 2 \times 3$ $64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$ From the above data, 64 is not divisible by 12 (i.e., LCM is not divisible by HCF) Therefore, There can't be two numbers with HCF 12 and LCM 64. 19. Capacity of first container = 144 Capacity of second container = 180 Capacity of third container = 192 Capacity of container which can measure the milk of all container. $144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$ $180 = 2 \times 2 \times 3 \times 3 \times 5$

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 $192 = 2 \times 3$ Common factors = 2, 2, 3 HCF = 12

Capacity of container = 12 litres.

20. Length of a room 9m 60 cm = 960 cm

Breadth of a room = 900 cm

Height of a room = 7 m 20 cm = 720 cm

2	960	2	900		2	720
2	480	2	450		2	360
2	240	3	225		2	180
2	120	3	75		3	90
2	60	5	25		3	30
2	30	5	5	_	2	10
3	15		1	_ `	5	5
5	5					1
	1					

 $960 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5$ $900 = 2 \times 2 \times 3 \times 3 \times 5 \times 5$ $720 = 2 \times 2 \times 2 \times 2 \times 3 \times 5$ Common factors = 2, 2, 3, 5 HCF = 2 \times 2 \times 3 \times 5 = 60 cm Length of the longest tape = 60 cm.

21. Capacity of first container = 208 kg Capacity of second container = 494 kg Capacity of third container = 949 kg Capacity of bag =



2	208		2	494		13	949
2	104		13	247	_	73	73
2	52		19	19	_		1
2	26			1	_		
13	13						
	1						
208 =	= 2 × 2 × .	2×2×1	3				
494 =	$494 = 2 \times 13 \times 19$						
949 =	= 13 × 73						
Com	mon fac	tor = 13					

Capacity of bag = 13 kg

22. Heap of shots made into group of 28, 32 and 42 $\,$

Leaves remainders = 5

HCF = 13

Least number of shots

2	28,	32,	42		
2	14,	16,	21		
2	7,	8,	21		
2	7,	4,	21		
2	7,	2,	21		
7	7,	1,	21		
3	1,	1,	3		
	1,	1,	1		
LCIV	1 = 2 × 2	$2 \times 2 \times 1$	2×2×3	3×7	
= 672					
Least number of shots = 672 + 5					
			:	= 677	

23. First factory blow sirens at an

interval of = 40 mins.

Second factory blow sirens at an

interval of = 60 mins.



Third factory blow sirens at an

interval of = 90 mins.

Time between two simultaneous sounds =

2	40,	60,	90	
2	20,	30,	45	
2	10,	15,	45	
3	5,	15,	45	
3	5,	5,	15	
5	5,	5,	5	
	1,	1,	1	
LCN	1 = 2 × 2	2×2×	3×5	
	= 360)		

Time between two simultaneous sounds

= 360 min = 6 hours

24. Given that, at every 6th block school bus makes a stop.

Another school bus starting from the same place stops at every eighth blocks of flats.

Finding the LCM of 6th block and 8th block

 $6 = 3 \times 2$ $8 = 2 \times 2 \times 2$

LCM of numbers,

= 2 × 2 × 2 × 3 = 24

Thus, first bus stop at which both of them will stop is 24.

25. In order to arrange the books as required, we have to find the largest number that divides 96, 240 and 336 exactly. Clearly, such a number is their HCF.

We have,

 $96 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3$ $240 = 2 \times 2 \times 2 \times 2 \times 3 \times 5$



and, 336 = $2 \times 2 \times 2 \times 2 \times 3 \times 7$

HCF of 96, 240 and $336 = 2 \times 2 \times 2 \times 2 \times 3 = 48$ So, there must be 48 books in each stack.

Number of stacks of Mathematics books = $\frac{96}{48}$ = 2 Number of stacks of Chemistry books = $\frac{240}{48}$ = 5 Number of stacks of Physics books = $\frac{336}{48}$ = 7

Multiple Choice Questions MCQs

1.	(d)	2.	(b)	3.	(a)	4.	(C)	5.	(b)	6.	(C)
7.	(a)	8.	(d)	9.	(C)	10.	(C)	11.	(b)	12.	(a)

- 1. 36 = 1, 2, 3, 4, 6, 9, 12, 18, 36
- 7. 12 = 1, 2, 3, 4, 6, 12
 - 25 = 1, 5, 25
 - CF = 1
- 8. LCM \times HCF = Product of two numbers

Χ

$$143 = 11 \times \frac{143^{13}}{11} = x$$

 $13 = x$

12. Let the no.'s be 3x and 4x

LCM = 48 HCF = x HCF × LCM = Product of two numbers $x \times 48 = 4x \times 3x$ $48 = \frac{12x^2}{x}$



$$\frac{48^4}{\lambda 2_1} = x \qquad \qquad x = 4$$

Fill in the blanks

- 1. 1 2. their product 3. odd 4. 8, 16 5. Twin primes
- 6. itself 7. number 8.5



Exercise-4.1

- 1. Write the opposite of the following statements:
 - (i) withdrawing money from the bank
 - (ii) 30 km towards North
 - (iii) Loss of 2000
 - (iv) Increase in population
 - (v) Early by 30 minutes
 - (vi) 25°C above freezing point
 - (vii) spending of `5000
 - (viii) 400 m below sea level.
- 2. Represent the following as integers with appropriate signs:
 - (i) +150 m (ii) + 700 (iii) -35 (iv) +32°C (v) - 3000 (vi) -20 m (vii) -5 km (viii) +40
- 3. Mark the following integers on a number line :



(iii)
$$\underbrace{-3}_{-2} - 2 - 1 \ 0 \ 1 \ 2 \ 3$$

(iv) $\underbrace{-3}_{-2} - 2 - 1 \ 0 \ 1 \ 2 \ 3$
(v) $\underbrace{-3}_{-5} - 4 \ -3 \ -2 \ -1 \ 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8}$
(v) $\underbrace{-1}_{-8} - 7 \ -6 \ -5 \ -4 \ -3 \ -2 \ -1 \ 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8}$
4. Use a number line to find the integer which is
(i) $\underbrace{-1}_{-5} - 4 \ -3 \ -2 \ -1 \ 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8}$
Required integer =2
(ii) $\underbrace{-1}_{-8} - 7 \ -6 \ -5 \ -4 \ -3 \ -2 \ -1 \ 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8}$
Required integer = -5
(iii) $\underbrace{-1}_{-7} - 6 \ -5 \ -4 \ -3 \ -2 \ -1 \ 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8}$
Required integer = -4
(iv) $\underbrace{-1}_{-8} - 7 \ -6 \ -5 \ -4 \ -3 \ -2 \ -1 \ 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8}$
Required integer = -3
(v) $\underbrace{-1}_{-6} - 5 \ -4 \ -3 \ -2 \ -1 \ 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8}$
Required integer = 5
(v) $\underbrace{-1}_{-6} - 5 \ -4 \ -3 \ -2 \ -1 \ 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8}$
Required integer = -6
5. Write five integers which are
(i) $-11, -10, -9, -8, -7$ (ii) $71, 72, 73, 74, 75$

(iii) -37,-36,-35,-34,-33 (iv) -2,-1,0,1,2

- 6. How many integers are between? Write all of them: (i) -4, -3, -2, -1, 0, 1, 2(ii) 4, 5, 6, 7,8 (iv) 1, 2, 3, 4, 5, 6 (iii) -6, -5, -4(v) -7, -6, -5, -4, -3, -2, -1(vi) - 3 - 27. Find the absolute value of the following numbers: (i) 317 (ii) 37 (iii) 52 (iv) 0 (v) 165 (vi) 256 8. Find the absolute value of each of the following : (i) 3 + 3 = 6(ii) 10 - 31 = -21(iv) -10 - 8 = -18(iii) 7 - 4 = 3(v) -20 + 12 = -8(vi) -20 9. Arrange the following integers in the ascending order :
 - (i) -9, -7, -3, 0, 1, 3
 - (ii) -70, -16, 8, 52, 90
 - (iii) -751, -715, -517, -175, -157
 - (iv) -502, -415, -189, 310, 312
- 10. Arrange the following integers in the descending order:

(i) 5, 3, 0, -5, -7, -9, -10 (ii) 100, 90,89, -75, -91, -95

- (iii) 185, 107, 17, -7, -106, -185 (iv) 75, 57, 20, -17, -31, -80
- 11. Write the next three integers in each of the following patterns:

- 12. True or False-
 - (i) T (ii) F (iii) T (iv) F (v) F Exercise-4.2
 - 1. Find the value of the following by the using number line :
 - (i) (-5) + 7





(ii) 8 + (-6)





$$-6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8$$
$$= -6$$



- 2. Find the sum of the following :
 - (i) 567 + (-897) = 567 - 897 = -330
 - (ii) -458 + 765 = 307
 - (iii) 510 + (-217)



= 510 - 217 = 293(iv) -3124 + (-1324)= -3124 - 1314 = -4438

- 3. Find the additive inverse of each of the following integers :
 - (i) -731 + 731 = 0 Additive inverse = 731
 - (ii) 72 + (-72) = 0
 Additive inverse = -72
 (iii) 0 + 0 = 0

Additive inverse = 0

- (iv) -100 + 100 = 0
 - Additive inverse = 100
- 4. Find the successor of each of the following :

(i)	-31 + 1 = -30	(ii) $-60 + 1 = -59$
(iii)	29 + 1 = 30	(iv) 0 + 1 = 1

5. Find the predecessor of each of the following :

(i)	-80 - 1 = -81	(ii) 100 – 1 = 99
(iii)	0 - 1 = -1	(iv) -79 - 1 = -80

- 6. Find the value of
 - (i) -15 + 34 14 6= -35 + 34 = -1(ii) -12 - (-5) - (-125) + 270= -12 + 5 + 125 + 270= 388(iii) 1101 + (-1011) + 1111 + (-1010)= 1101 - 1011 + 1111 - 1010
 - = 2212 2021 = 191
 - (iv) 518 + (-217) + 113 + (-188) = 518 - 217 + 113 - 188



= 631 - 405 = 226 7. Sum of two integers = 717 First integer = -377Second integer = x-377 + x = 717x = 717 + 377 = 10948. Sum of -215 and 355 355 -215 140 $140 - (-91)_1 = 140 + 91$ 140 -91 231 = 231 9. Temperature in afternoon Temperature in night dropped by 5° C *i.e.*, 2°C – 5°C Temperature at night = $-3^{\circ}C$ 10. Temperature at 12 pm = $+19^{\circ}$ C Temperature at midnight = $-2^{\circ}C$ Difference = $[19 - (-2)]^{\circ}C$ $= [19 + 2]^{\circ}C = 21^{\circ}C$ 11. Reeta's score = 35, -5, -10, -20 Total score = 35 + (-5) + (-10) + (20)= 35 - 5 - 10 + 20 = 55 - 15 = 4012. Point of maximum depth = -12600 m



Point of mountain = +9846 m
Vertical distance =
$$-12600 - (+9846)$$

= $(-12600 - 9846)$ m
= -22446 m
13. Insert > or < in :
(i) $(-4) + (-6) - (-4) - (-6)$
 $-4 - 6 - 4 + 6$
 $-10 < 2$
(ii) $(-12) - (+18) - (+29) - (+52)$
 $-12 - 18 - (+29) - (+52)$
 $-12 - 18 - (+29) - (+52)$
 $-12 - 18 - (+29) - (+52)$
 $-30 < -23$
(iii) $28 - (-10) - (-16) - (-76)$
 $28 + 10 - 16 + 76$
 $38 < 92$
(iv) $(-121) + (+181) - (60) + (+130)$
 $-121 + 181 - 190$
 $60 < 90$
14. Fill in the blanks :

(i) (-30) + 30 = 0 (ii) 0 + 80 = 80

(iii)
$$61 + (-79) = -18$$
 (iv) $-27 + 9 = -18$

(v) -3 + (-17) = -20

Multiple Choice Questions (MCQs)

1.	(C)	2.	(b)	3.	(d)	4.	(d)	5.	(C)	6.	(a)
7.	(d)	8.	(b)	9.	(C)	10.	(d)	11.	(b)	12.	(a)

Fill in the blanks

1.	1	2. positive	3. zero	4.75
5.	4	6. left	7. zero	8. –100






20 minutes =
$$\frac{1}{3\phi 0} \times {}^{1}2\phi$$
 hours
= $\frac{1}{3}$

4. Represent the following fractions on a number line :

• I I I I I I I I I	
0 1 5	10
	10
10 10 10	10

5. Represent the following fractions on a number line :

1	1	1	1	1	1	1	1	1		
1	1	1	1	1	1		1		-	
0	1			4	5				9	
0	<u> </u>		_	<u> </u>						
	0		(9	0				0	
	/			/	/				/	

6. No. of pens in a box = 36

No. of pens Ravi gave to Yashvi = $\frac{1}{2} \times 36 = 18$ pens

Yashvi get 18 pens

No. of pens Ravi left with = 36 - 18 = 18 pens.

7. Natural numbers from 2 to 12

2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 Prime numbers = 2, 3, 5, 7, 11

Fraction = $\frac{5}{11}$

Exercise-5.2

1. Convert each of the following into a mixed fraction :





- 2. Convert each of the following into an improper fraction :
 - (i) $\frac{7 \times 4 + 1}{7} = \frac{29}{7}$ (ii) $\frac{12 \times 16 + 5}{12} = \frac{197}{12}$ (iii) $\frac{17 \times 151 + 11}{17} = \frac{2578}{17}$ (iv) $\frac{17 \times 18 + 1}{17} = \frac{307}{17}$ 74 Brilliant Mathematics-6

3. Show that the following fractions are equivalent :

(i)
$$\frac{18}{27} \xrightarrow{36} \frac{36}{54}$$

 $18 \times 54 = 27 \times 36$
 $972 = 972$

Therefore, they are equivalent fraction.

(ii)
$$\frac{5}{13}$$
 $\frac{15}{39}$
 $5 \times 39 = 13 \times 15$
 $195 = 195$

Therefore, they are equivalent fraction.

(iii)
$$\frac{5}{9} \xrightarrow{30} \frac{30}{54}$$
$$5 \times 54 = 30 \times 9$$

Therefore, they are equivalent fraction.

(iv)
$$\frac{10}{23} \xrightarrow{50}_{115}$$

 $10 \times 115 = 23 \times 50$
 $1150 = 1150$

Therefore, they are equivalent fraction.

4. Find the equivalent fraction of $\frac{7}{9}$ having (i) $\frac{7 \times 4}{9 \times 4} = \frac{28}{36}$ (ii) $\frac{7 \times 10}{9 \times 10} = \frac{70}{90}$ (iii) $\frac{7 \times 7}{9 \times 7} = \frac{49}{63}$ (iv) $\frac{7}{9} \times \frac{13}{13} = \frac{91}{117}$ 5. $\frac{756 \div 2}{882 \div 2} = \frac{378 \div 3}{441 \div 3} = \frac{126 \div 3}{147 \div 3} = \frac{42}{49}$



 $\frac{42\div7}{49\div7}=\frac{6}{7}$

- 6. Reduce each of the following into its simplest form :
 - (i) $\frac{150 \div 10}{60 \div 10} = \frac{15 \div 3}{6 \div 3} = \frac{5}{2}$ (ii) $\frac{162 \div 2}{108 \div 2} = \frac{81 \div 3}{54 \div 3} = \frac{27 \div 3}{18 \div 3} = \frac{9 \div 3}{6 \div 3} = \frac{3}{2}$ (iii) $\frac{161 \div 7}{203 \div 7} = \frac{23}{29}$ (iv) $\frac{1875 \div 5}{2175 \div 5} = \frac{375 \div 5}{435 \div 5} = \frac{75 \div 3}{87 \div 3} = \frac{25}{29}$
- 7. Write any 3 equivalent fractions to each of the following given fraction :

(i)	$\frac{23 \times 2}{15 \times 2} = 23 \times 4$	$=\frac{46}{30}$ 92	$\frac{23}{15} \times \frac{3}{3} = \frac{69}{45}$
	$\frac{15 \times 4}{15 \times 4}$	60	
	Equival	ent fraction =	$\frac{46}{30}, \frac{69}{45}, \frac{92}{60}$
(;;;)	7×2	14	7×3_21
(1)	25 × 2	50	$\frac{1}{25 \times 3} = \frac{1}{75}$
	7 × 4	28	
	25 × 4	100	
	Equival	ent fraction =	$\frac{14}{50}$, $\frac{21}{75}$, $\frac{28}{100}$
/:::)	9×2	18	9×3 27
(11)	$\frac{11}{11 \times 2}$	22	$\frac{11}{11 \times 3} = \frac{13}{33}$
	9×4	36	
	$\frac{11 \times 4}{11 \times 4}$	44	
	Equival	ent fraction =	$\frac{18}{22}, \frac{27}{33}, \frac{36}{44}$



(iv)	$\frac{41 \times 3}{17 \times 2} = \frac{82}{34}$ $\frac{41 \times 4}{17 \times 4} = \frac{164}{68}$	$\frac{41\times3}{17\times3} = \frac{123}{51}$
	Equivalent fraction =	82 123 164 34 51 68

8. Compare each pair of fractions and write which is greater :

(i)
$$\frac{12}{24}$$
 and $\frac{6}{8}$
 $\frac{12 \times 1}{24 \times 1} = \frac{12}{24}$
 $\frac{6 \times 3}{8 \times 3} = \frac{18}{24}$
 $\frac{12}{24} < \frac{18}{24}$
 $\frac{12}{24} < \frac{6}{8}$
(ii) $\frac{6}{7}$ and $\frac{6}{11}$
 $\frac{6}{7} > \frac{6}{11}$
(iii) $\frac{3}{8}$ and $\frac{7}{8}$
 $\frac{3}{8} < \frac{7}{8}$
(iv) $\frac{15}{8}$ and $\frac{4}{9}$
 $\frac{15 \times 9}{8 \times 9} = \frac{135}{72}$
 $\frac{4 \times 8}{9 \times 8} = \frac{32}{72}$



- $\frac{135}{72} > \frac{32}{72}$ $\frac{15}{8} > \frac{4}{9}$
- 9. Arrange the following fractions in the ascending order :
 - (i) $\frac{1}{5} < \frac{2}{5} < \frac{3}{5} < \frac{4}{5}$ (ii) $\frac{5 \times 180}{11 \times 180} = \frac{900}{1980}$ $\frac{7 \times 165}{12 \times 165} = \frac{1155}{1980}$ $\frac{3 \times 198}{10 \times 198} = \frac{594}{1980}$ $\frac{4 \times 220}{9 \times 220} = \frac{880}{1980}$ $\frac{3 \times 396}{5 \times 396} = \frac{1188}{1980}$ 594 880 900 1155 1188 <u>1980</u> ' <u>1880</u> ' <u>18</u> $\frac{3}{10} < \frac{4}{9} < \frac{5}{11} < \frac{7}{12} < \frac{3}{5}$ (iii) $\frac{2 \times 20}{7 \times 20} = \frac{40}{140}$ $\frac{11\times4}{35\times4} = \frac{44}{140}$ $\frac{9 \times 10}{14 \times 10} = \frac{90}{140}$ $\frac{13\times5}{28\times5} = \frac{65}{140}$ $\frac{40}{140} < \frac{44}{140} < \frac{65}{140} < \frac{90}{140}$



$$\frac{2}{7} < \frac{11}{35} < \frac{13}{28} < \frac{9}{14}$$

(iv)
$$\frac{3 \times 7}{8 \times 7} = \frac{21}{56}$$
$$\frac{5 \times 8}{7 \times 8} = \frac{40}{56}$$
$$\frac{3 \times 8}{7 \times 8} = \frac{24}{56}$$
$$\frac{1 \times 7}{8 \times 7} = \frac{7}{56}$$
$$\frac{5 \times 4}{14 \times 4} = \frac{20}{56}$$
$$\frac{7}{56} < \frac{20}{56} < \frac{21}{56} < \frac{24}{56} < \frac{40}{56}$$
$$\frac{1}{8} < \frac{5}{14} < \frac{3}{8} < \frac{3}{7} < \frac{5}{7}$$

10. Arrange the following fractions in the descending order :

(i)
$$\frac{4 \times 8}{6 \times 8} = \frac{32}{48}$$
$$\frac{3 \times 6}{8 \times 6} = \frac{18}{48}$$
$$\frac{6 \times 4}{12 \times 4} = \frac{24}{48}$$
$$\frac{5 \times 3}{16 \times 3} = \frac{15}{48}$$
$$\frac{32}{48} > \frac{24}{48} > \frac{18}{48} > \frac{15}{48}$$
$$\frac{4}{6} > \frac{6}{12} > \frac{3}{8} > \frac{5}{16}$$
(ii)
$$\frac{4 \times 6}{15 \times 6} = \frac{24}{90}$$



$$\frac{8 \times 10}{9 \times 10} = \frac{80}{90}$$

$$\frac{5 \times 15}{6 \times 15} = \frac{75}{90}$$

$$\frac{1 \times 30}{3 \times 30} = \frac{30}{90}$$

$$\frac{80}{90} > \frac{75}{90} > \frac{30}{90} > \frac{24}{90}$$

$$\frac{8}{9} > \frac{5}{6} > \frac{1}{3} > \frac{4}{15}$$
(iii)
$$\frac{3 \times 3}{8 \times 3} = \frac{9}{24}$$

$$\frac{3 \times 2}{12 \times 2} = \frac{6}{24}$$

$$\frac{3 \times 4}{6 \times 4} = \frac{12}{24}$$

$$\frac{3 \times 6}{4 \times 6} = \frac{18}{24}$$

$$\frac{18}{24} > \frac{12}{24} > \frac{9}{24} > \frac{6}{24}$$

$$\frac{3}{4} > \frac{3}{6} > \frac{3}{8} > \frac{3}{12}$$
(iv)
$$\frac{2 \times 20}{7 \times 20} = \frac{4}{140}$$

$$\frac{11 \times 5}{28 \times 5} = \frac{55}{140}$$

$$\frac{55}{140} > \frac{50}{140} > \frac{44}{140} > \frac{40}{140}$$

$$\frac{11}{28} > \frac{5}{14} > \frac{11}{35} > \frac{2}{7}$$

11. Fill in the blanks :

(i)
$$\frac{2 \times 15}{3 \times 15} = \frac{30}{45}$$
$$\frac{2}{3} \times \frac{6}{6} = \frac{12}{18}$$
(ii)
$$\frac{4 \times 4}{5 \times 4} = \frac{16}{20}$$
$$\frac{4 \times 6}{5 \times 6} = \frac{24}{30}$$
(iii)
$$\frac{45 \div 3}{60 \div 3} = \frac{15}{20}$$
$$\frac{45}{60} \times \frac{2}{2} = \frac{90}{120}$$
(iv)
$$\frac{6 \times 4}{11 \times 4} = \frac{24}{44}$$
$$\frac{6 \times 11}{11 \times 11} = \frac{66}{121}$$

12. Compare the given fraction using the symbols =, > or <

(i)
$$\frac{22}{110} \square \frac{4}{21}$$

 $\frac{2}{10} \square \frac{4}{21}$
 $\frac{2 \times 21}{10 \times 21} = \frac{42}{210}$
 $\frac{42}{210} > \frac{40}{210}$
 $\frac{42}{210} > \frac{40}{210}$
(ii) $\frac{3}{3} \square \frac{4}{4}$
 $\frac{1}{1} \square \frac{1}{1} \square \frac{1}{1}$
Brilliant Mathematics-6

(iii) $\frac{13}{6} \ge \frac{5}{6}$
(iv) $\frac{1}{7} < \frac{1}{4}$



1. Add the following fractions :

	(i)	$\frac{1+4}{1+4} = \frac{5}{2}$ (ii) $\frac{4+5}{1+4} = \frac{9}{2}$
	(1)	3 3 13 13
	(iii)	$\frac{7}{3} + \frac{4}{3} = \frac{11}{3}$ (iv) $\frac{2+2}{14} = \frac{4}{14} = \frac{2}{7}$
	(v)	$\frac{4+12}{18} = \frac{16}{18} = \frac{8}{9}$
	(vi)	$\frac{5}{4} + \frac{18}{5} = \frac{25 + 72}{20} = \frac{97}{20}$
	(vii)	$\frac{5}{1} + \frac{43}{7} = \frac{35 + 43}{7} = \frac{78}{7}$
	(viii)	$\frac{15}{2} + \frac{25}{6} = \frac{45 + 25}{6} = \frac{70}{6} = \frac{35}{3}$
2.	Sim	olify :
	(i)	$\frac{29}{11} + \frac{23}{22} + \frac{73}{33}$
		174 + 46 + 146
		66
		$=\frac{366}{66}=\frac{183}{33}$
	(ii)	$\frac{8+9+6}{12} = \frac{23}{12} = 1\frac{11}{12}$
	(iii)	$\frac{14}{3} + \frac{13}{4} + \frac{15}{2}$
		$14 \times 4 + 13 \times 3 + 15 \times 6$
		12
		82 Brilliant Mathematics-6

$$= \frac{56 + 39 + 90}{12}$$

$$= \frac{185}{12}$$

$$= 15\frac{5}{12}$$
(iv) $\frac{7}{1} + \frac{7}{4} + \frac{31}{6}$

$$= \frac{84 + 21 + 62}{12} = \frac{167}{12} = 13\frac{11}{12}$$
3. Subtract the following fractions :
(i) $\frac{1}{5}$ (ii) $\frac{3}{11}$ (iii) $\frac{13}{4} - \frac{5}{4} = \frac{8^2}{4_1} = 2$
(iv) $\frac{7}{8} - \frac{5}{6}$

$$= \frac{7 \times 3 - 5 \times 4}{24}$$

$$= \frac{21 - 20}{24} = \frac{1}{24}$$
(v) $\frac{17}{10} - \frac{3}{2}$

$$= \frac{17 \times 1 - 3 \times 5}{10}$$

$$= \frac{17 \times 1 - 3 \times 5}{10}$$
(vi) $\frac{41}{7} - \frac{8}{3}$

$$= \frac{41 \times 3 - 8 \times 7}{21}$$

$$= \frac{123 - 56}{21} = \frac{67}{21} = 3\frac{4}{21}$$
(83) Brilliant Mathematics-6

(vii)
$$\frac{33}{4} - \frac{17}{6}$$

 $\frac{33 \times 3 - 17 \times 2}{12}$
 $= \frac{99 - 34}{12}$
 $= \frac{65}{12} = 5\frac{5}{12}$
(viii) $\frac{121}{14} - \frac{87}{14} = \frac{34}{14} = \frac{17}{7} = 2\frac{3}{7}$
(ix) $\frac{155}{21} - \frac{11}{8}$
 $\frac{155 \times 8 - 11 \times 21}{168}$
 $= \frac{1240 - 231}{168}$
 $= \frac{1240 - 231}{168}$
 $= \frac{1009}{168} = 6\frac{1}{168}$
4. Simplify :
(i) $5 + \frac{43}{7} - \frac{71}{14}$
 $= \frac{5 \times 14 + 43 \times 2 - 71 \times 1}{14}$
 $= \frac{70 + 86 - 71}{14}$
 $= \frac{85}{14} = 6\frac{1}{14}$
(ii) $\frac{22}{3} + \frac{11}{3} - \frac{31}{6}$
 $= \frac{22 \times 2 + 11 \times 2 - 31 \times 1}{6}$
 $= \frac{44 + 22 - 31}{6}$
Brilliant Mathematics-6

$$=\frac{35}{6} = 5\frac{5}{6}$$
(iii) $\frac{5}{6} + 3 - \frac{3}{4}$
 $\frac{5 \times 2 + 3 \times 12 - 3 \times 3}{12}$
 $=\frac{10 + 36 - 9}{12} = \frac{37}{12}$
(iv) $\frac{4}{3} - \frac{21}{16} + \frac{19}{12} - \frac{2}{3}$
 $=\frac{4 \times 16 - 21 \times 3 + 19 \times 4 - 2 \times 16}{48}$
 $=\frac{64 - 63 + 76 - 32}{48}$
 $=\frac{45}{48} = \frac{15}{16}$
(v) $\frac{191}{4} + \frac{11}{3} - \frac{28}{5}$
 $=\frac{191 \times 15 + 11 \times 20 - 28 \times 12}{60}$
 $=\frac{2865 + 220 - 336}{60}$
 $=\frac{2749}{60} = 45\frac{49}{60}$
(vi) $\frac{142}{15} + \frac{11}{5} - \frac{221}{30} - \frac{77}{25}$
 $=\frac{142 \times 10 + 11 \times 30 - 221 \times 5 - 77 \times 6}{150}$
 $=\frac{1420 + 330 - 1105 - 462}{150}$
 $=\frac{183}{150} = \frac{61}{50}$

5. Fill in the blanks :

(i)
$$\frac{6}{9} - \frac{4}{9} = \frac{2}{9}$$

(ii) $\frac{1}{2} + \frac{1}{5} = \frac{1 \times 5 + 1 \times 2}{10} = \frac{5 + 2}{10} = \frac{7}{10}$
(iii) $\frac{1}{2} - \frac{1}{5} = \frac{1 \times 4 - 1 \times 1}{12}$
 $= \frac{4 - 1}{12} = \frac{3}{12} = \frac{1}{4}$
(iv) $\frac{2}{5} - \frac{0}{5} = \frac{2}{5}$
(v) $\frac{5}{17} + \frac{3}{17} = \frac{8}{17}$
(vi) $\frac{29}{5} - \frac{4}{5} = \frac{25^5}{5_1} = \frac{5}{1}$
6. Quantity of flour = $7\frac{3}{4} = \frac{31}{4}$ kg
Quantity of pulses = $4\frac{1}{2} = \frac{9}{2}$ kg
Quantity of rice = $5\frac{1}{8} = \frac{41}{8}$ kg
Total commodities bought = $\frac{31}{4} + \frac{9}{2} + \frac{41}{8}$
 $= \frac{31 \times 2 + 9 \times 4 + 41 \times 1}{8}$
 $= \frac{62 + 36 + 41}{8}$
 $= \frac{139}{8} = 17\frac{3}{8}$ kg
7. Height of Sarika = $140\frac{1}{5}$ cm = $\frac{701}{5}$ cm

Height of Monika =
$$138\frac{3}{4}$$
 cm = $\frac{555}{4}$ cm
Comparison =

$$= \frac{701}{5} - \frac{555}{4}$$

$$= \frac{701 \times 4 - 555 \times 5}{20}$$

$$= \frac{2804 - 2775}{20} \qquad \frac{2804}{20} > \frac{2775}{20}$$

$$= \frac{29}{20} = 1\frac{9}{20} \text{ cm}$$
Sarika is taller by $1\frac{9}{20}$ cm.

8. Time taken by Leena to walk across school ground = $2\frac{1}{5} = \frac{11}{5}$ mins

Time taken by Reena to walk across school ground = $\frac{7}{4}$ mins Comparison

$$= \frac{11}{5} - \frac{7}{4}$$

$$= \frac{11 \times 4 - 7 \times 5}{20}$$

$$= \frac{44 - 35}{20} \qquad \frac{44}{20} > \frac{35}{20}$$

$$= \frac{9}{20} \text{ mins}$$
Reena takes less time by $\frac{9}{20}$ minutes.
9. Cost of apples = $10\frac{1}{2} = \frac{21}{2}$
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Cost of grapes = $8\frac{1}{2} = \frac{17}{2}$ Cost of bananas = 5 Total money spent = $\frac{21}{2} + \frac{17}{2} + \frac{5}{1}$ $=\frac{21\times1+17\times1+5\times2}{2}$ $=\frac{21+17+10}{2}$ $=\frac{48}{2}=24$ Rajesh spent `24 to buy fruits. 10. Age of Sunil = $64\frac{3}{4}$ years = $\frac{259}{4}$ yrs Age of Sohan = $49\frac{1}{8}$ years = $\frac{393}{8}$ yrs Difference = $\frac{259}{4} - \frac{393}{8}$ $=\frac{259\times2-393\times1}{8}$ $=\frac{518-393}{8}$ $=\frac{125}{8}=15\frac{5}{8}$ years Sunil is older by $15\frac{5}{8}$ years.

Multiple Choice Questions (MCQs)

1.	(a)	2.	(d)	3.	(C)	4.	(d)	5.	(a)	6.	(a)
7.	(C)	8.	(b)	9.	(a)	10.	(C)	11.	(b)	12.	(d)



3.
$$\frac{12^{6^{3}}}{20_{105}} = \frac{3}{5}$$
4.
$$\frac{8}{15} = \frac{1}{3}, \frac{6}{18} = \frac{1}{3}, \frac{4}{12} = \frac{1}{3}, \frac{7}{20}$$
5.
$$\frac{1}{2} - \frac{2}{3}$$

$$1 \times 3 = 2 \times 2$$

$$3 \quad 4$$

$$\frac{1}{2}, \frac{2}{3} \text{ is not equivalent.}$$
6.
$$\frac{1}{2}, \frac{3}{7}, \frac{3}{5}, \frac{4}{9}$$

$$\frac{1}{2} \times \frac{315}{315} = \frac{315}{630}$$

$$\frac{3}{7} \times \frac{90}{90} = \frac{270}{630}$$

$$\frac{3}{5} \times \frac{126}{126} = \frac{378}{630}$$

$$\frac{7}{9} \times \frac{70}{70} = \frac{280}{630}$$

$$8. \quad \frac{8}{24} = \frac{1}{3}$$

$$9. \quad \frac{3}{5} \times \frac{4}{4} = \frac{12}{20}$$

$$10. \quad \frac{77}{4}$$

$$4 \quad \frac{19}{77} \quad ($$

$$\frac{44}{37}, \frac{36}{30}, \frac{1}{3})$$

$$= 19\frac{1}{4}$$
11. $x + 6\frac{7}{15} = 8\frac{1}{5}$
 $x = 8\frac{1}{5} - 6\frac{7}{15}$
 $= \frac{41}{5} - \frac{97}{15}$
 $= \frac{41 \times 3 - 97 \times 1}{15}$
 $= \frac{123 - 97}{15}$
 $= \frac{26}{15} = 1\frac{11}{15}$
12. $\frac{12^{6}}{24_{122}} \times \frac{36^{18}}{72_{362}}$
 $= \frac{1}{4}$

Fill in the blanks

1.	like	2. unlike	3. mixed	$4.1\frac{2}{3}$
5.	like	6. 28	7. mixed	8. like





1. Write the following decimals in the place value chart:



	Thous ands	Hund reds	Tens	Ones	Tenths	Hundr edths	Thousa ndths
(i)			3	2	5		
(ii)			2	5	1	5	
(iii)			4	7	5	0	9
(iv)					3	1	5

2. Write each of the following decimals in words :

(i) Thirty four hundredths

(ii) Eight and five thousandths

(iii) Four tenths five hundredths six thousandths

(iv) Two hundred seventy five and seven thousandths

3. Write each of the following as decimals :

(i) 6.03 (ii)19.19 (iii) 407.105 (iv) 4020.072

4. Write each of the following in the decimal form :

(i) 10.0845 (ii)0.6387 (iii) 260.107 (iv) 4701.0345

5. Convert each of the following decimals into a fraction :

(i)
$$0.004 = \frac{4 \div 2}{1000 \div 2} = \frac{2 \div 2}{500 \div 2} = \frac{1}{250}$$

(ii) $2.0015 = \frac{20015 \div 5}{10000 \div 5} = \frac{4003}{2000}$
(iii) $0.000 = \frac{082 \div 2}{10000 \div 5} = \frac{4003}{2000}$

(III)
$$0.82 = \frac{100 \div 2}{100 \div 2} = \frac{100}{50}$$

(iv)
$$2.34 = \frac{234 \div 2}{100 \div 2} = \frac{117}{50}$$

(v)
$$21.4 = \frac{214 \div 2}{10 \div 2} = \frac{107}{5}$$

(vi)
$$13.45 = \frac{1345 \div 5}{100 \div 5} = \frac{269}{20}$$



6. Convert each of the following into a decimal :

(i) 6.3 (ii) 0.0485
(iii)
$$\frac{35 \times 25}{4 \times 25} = \frac{875}{100} = 8.75$$

(iv) $\frac{77}{8} = \frac{77 \times 125}{8 \times 125} = \frac{9625}{1000} = 9.625$
(v) $12\frac{5}{8} = 12 + \frac{5 \times 125}{8 \times 125} = 12 + \frac{625}{1000}$
 $= \frac{12000 + 625}{1000} = \frac{12625}{1000} = 12.625$
(vi) $25\frac{1}{4} = 25 + \frac{1 \times 25}{4 \times 25} = 25 + \frac{25}{100}$
 $= \frac{2500 + 25}{100} = \frac{2525}{100} = 25.25$
Exercise-6 2

1. Which of the following are like decimals:

(i)	45.05, 20.65	(ii)	1.34, 0.07, 5.35, 42.07

- (iii) 4.50, 16.80, 8.07 (iv) 8.80, 17.08, 9.84, 0.27
- 2. Convert each of the following sets of unlike decimals to like decimals:
 - (i) 7.58, 7.50 (ii) 0.400, 5.700, 12.963
 - (iii) 5.296, 5.290, 5.000 (iv) 4.3294, 53.9200, 324.1700
- 3. Arrange the following decimals in an ascending order :
 - (i) 8.070, 8.180, 8.600, 9.003, 1.790
 - 1.790 < 8.070 < 8.180 < 8.600 < 9.003 Required ascending order 1.79 < 8.07 < 8.18 < 8.6 < 9.003
 - (ii) 20.0500, 600.1000, 2.0030, 1.3003, 10.0030
 1.3003 < 2.0030 < 10.0030 < 20.0500 < 600.1000



Required ascending order 1.3003 < 2.003 < 10.003 < 20.05 < 600.1000

- (iii) 76.69, 7.69, 769.60, 76.06, 7.76, 77.80
 Required ascending order 7.69 < 7.76 < 76.06 < 76.69 < 77.80 < 769.6
- 4. Arrange the following decimals in descending order :
 - (i) 50.4 > 9.88 > 8.74 > 6.34 > 3.5 > 2.08
 - (ii) 98.88 > 78.5 > 9.77 > 9.56 > 9.06 > 2.019 > 1.87
 - (iii) 6.78 > 3.45 > 3.24 > 2.35 > 1.67
- 5. Express as metre (m) using decimals :

(i)
$$3 \text{ m} + \frac{45 \text{ m}}{100} = 3.45 \text{ m}$$

(ii)
$$\frac{237}{100}$$
 m = 2.37 m

(iii)
$$\frac{60}{100}$$
 m = 0.60 m

6. Express as kilogram (kg) using decimals :

(i)
$$\frac{85}{1000}$$
 kg = 0.085 kg

(ii)
$$\frac{5381}{1000}$$
 kg = 5.381 kg

(iii)
$$5 \text{ kg} + \frac{750}{1000} = 5.750 \text{ kg}$$

7. Express as kilometer (km) using decimals :

(i)
$$\frac{65}{1000}$$
 km = 0.065 km

(ii)
$$\frac{675}{1000}$$
 km = 0.675 km

(iii) 87 km +
$$\frac{125}{1000}$$
 km = 87.125 km



Exercise-6.3

1. Add the following decimals :

(i) $\begin{pmatrix} 1 \\ 6 \\ 8 \\ . \\ 5 \\ 0 \\ 0 \\ 3 \\ \hline 7 \\ 1 \\ . \\ 5 \\ 0 \\ 3 \\ \hline 3 \\ \hline 7 \\ 1 \\ . \\ 5 \\ 0 \\ 3 \\ \hline 3 $	(ii) $\begin{array}{c} (1) \\ 7 5 . 1 3 2 \\ + 2 4 . 9 0 0 \\ \hline 1 0 0 . 0 3 2 \end{array}$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	(iv) $ \begin{array}{c} (2) (3) (1) \\ 2 7 . 8 0 \\ 3 2 . 7 8 \\ 7 2 . 8 8 \\ + 2 9 . 9 0 \\ \hline 1 6 3 . 3 6 \end{array} $
(v) 1 2 1 . 2 1 0 1 2 5 . 6 7 0 1 3 6 . 0 9 0 1 0 . 1 8 4 + 1 2 3 . 8 9 7 5 3 2 . 6 5 8	(vi) $\begin{pmatrix} 2 & 3 & 2 \\ 8 & 2 & 4 & 8 & 0 \\ 3 & 4 & 6 & 8 & 0 \\ 6 & 4 & 7 & 5 & 1 \\ 8 & 5 & 7 & 0 & 0 \\ + & 4 & 3 & 7 & 0 & 0 \\ \hline 3 & 1 & 1 & 3 & 1 & 1 \\ \end{pmatrix}$
2. Subtract the following : (i) $\begin{array}{c} 4 & 16 \\ 8 & 8 \\ \hline 8 & 7 \\ \hline 9 \\ \hline -5 & 2 \\ \hline 3 & 2 \\ \hline 8 & 7 \end{array}$	(ii) $\begin{array}{c} 0 & 16 & 8 & 9 & 10 \\ \cancel{1} & \cancel{6} & \cancel{9} & \cancel{9} & \cancel{9} \\ - & 9 & \cancel{1} & . & 8 & 7 \\ \hline & 7 & 7 & . & 1 & 3 \end{array}$
0 12 2 10 (iii) 1 2 8 . 3 0 - 5 3 . 0 5 7 5 . 2 5	(iv) $\begin{array}{c} 1 & 12 & 1812 & 10 \\ 2 & 3 & . & 9 & 3 & 0 \\ - & 5 & . & 9 & 4 & 6 \\ \hline 1 & 7 & . & 9 & 8 & 4 \end{array}$



0999910		1 12 1812 10	
(v) 700.000	(vi)	78.170	
_ 76.291		25.488	
23.709		49.682	
3. Simplify:			
		1 1	
(1) 82.48		43.03	
+04.75		+34.08	
147.25		<u> </u>	
	0131612 XXX7.223		
	- 78.31		
_	68.92		
		1	
(II) 85.01 .25.71		27.10	
+33.71		+03.88	
		90.90	
	0 11 9 16 12		
	1 2 0 . 1 2		
	- 90.90		
	27.74		
(:::) 1 2 2 1	റ] 1 0 1 1 0	
	2	121.12	
+ 121.21	$\frac{0}{2}$	+ 9.40	
133.42	2	130.52	
	2 1	4	
	132.42	Ž 2	
	- 1 3 0 . 5 2	2 0	
	002.90) 2	
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	(iv) 2 4 . 0 0 + 1 5 . 2 6		39.260 -27.047	
	39.26		12.213	
	(v) $\begin{array}{c} 1 \\ 3 & 1 & 3 \\ + & 3 & 8 & 0 \\ \hline 3 & 1 & 7 & 2 & 7 \end{array}$	+	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	
		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		
	(vi) $\begin{array}{c} 1 \\ 1 & 1 \\ \cdot & \cdot & 0 \\ 0 \\ \hline + & 3 \\ \cdot & 5 \\ \hline 0 \\ \hline 1 \\ 5 \\ \cdot & 1 \\ 0 \\ 0 \\ \end{array}$		1 9.874 +4.000 13.874	
		4 10 9 1 5 . X Ø 0 - 1 3 . 8 7 4 1 . 2 2 6		
4.	6.125 + <i>x</i> = 9 <i>x</i> = 9 - 6.125	8 99 97.ØØ -6.12 2.87	10 0 5 5	
5.	Greatest two digit r 201.55 – $x = 99$ x = 201.55 - 99	number = 99	1 9 207.5 -99.00 10 2.55	5



6. Sum of 46.23 and 37.5

1 46.23						
+3 7.50						
83.73						
Sum of 45.031 and	39	9.7				
		4	1 5	0	3	1
	+	3	9	7	0	0
		8	4	7	3	1
84.731 - 83.73						
		8	4	7	3	1
	_	8	3	7	3	0
			1	0	0	1

- 7. Height of pea plant on Sunday = 6.5 cm Height of pea plant on Tuesday = 0.55 cm Height on Tuesday = 6.5 cm + 0.55 cm 16.50+0.557.05 cm
- 8. Quantity of wheat produced in Punjab = 3757025 kg 370 gQuantity of wheat produced in Haryana = 40703926 kg 430gQuantity of wheat produced in UP = 27859874 kg 580gTotal wheat produced = 3757025.370 kg + 40703926.430 kg+ 27859874.580 kg1 $\frac{1}{3}$ $\frac{7}{7}$ $\frac{5}{7}$ $\frac{7}{0}$ $\frac{2}{2}$ $\frac{5}{5}$. $\frac{3}{3}$ 7 0 4 0 7 0 3 9 2 6 . 4 3 0 + 2 7 8 5 9 8 7 4 . 5 8 0

72320826.380 kg

Total wheat by produced by three states = 72320526kg 380 g

9. Distance between Sirman's school and house = 10 km 670 m

= 10.670 km

Distance she travelled by foot = 2 km 275 m

= 2.275 km

Distance travelled by bus = 10.670 km

```
= 2.275 km
```

```
0 10 5 16 10

𝔅𝔅𝔅𝔅𝔅𝔅𝔅𝔅 km

- 2 . 2 7 5 km

- 8 . 3 9 5 km
```

Distance she covered by bus = 8 km 395 m

10. Weight of empty cylinder = 16 kg 750g
Weight of gas on cylinder = 14 kg 350 g
Total weight of filled cylinder = 16.750 + 14.350 kg

$$\begin{array}{c}1 & 1 \\1 & 6 \\+ & 1 & 4 \\\hline 3 & 1 \\\end{array}, \begin{array}{c}1 \\1 \\3 \\\hline 1 \\1 \\0 \\\hline \end{array}$$

Total weight of the filled cylinder = 31 kg 100g

11. Amount in a bank account = `53607975.85 Amount spent in January = `18977509.35 Amount spent in February = `14875919.45 Amount left in bank = `53607975.85 – (`18977509.35 + `14875919.45)

```
1 1 1 1 1 1 1 1

189 77509.35

+148 75919.45

33853428.80
```

Amount left

	4 12 15 10 6 15 8 8 6 8 7 9 7 8 . 8 5
	- 3 3 8 5 3 4 2 8 . 8 0
	<u>19754547.05</u>
12.	Temperature on Friday = 39.2°C
	Temperature on Sunday = 27.6°C
	Difference in temperature = (39.2 – 27.6)°C
	8 12 39:2 ~
	-2 7.6
	11.6
	Temperature difference = 11.6°C
13.	Cost of books = `987.85
	Cost of notebook = `85.30
	Cost of pens = `49.45
	Total money spent = $(987.85 + 85.30 + 49.45)$
	987.85
	85.30
	+49.45
	1122.60
	Total money spent =` 1122.60
	Money left with him = `1200 - `1120.60
	7200.00
	-1122.60
	//.40
	He had left with ` 77.40.
14.	Distance travelled by bus = 5 km 52 m

Distance travelled by car = 2 km 265 m Distance travelled by cycle = 1 km 30 m Total distance covered = 10 km Distance he walked on foot

= [10 - (5.052 + 2.265 + 1.030)] km

1 5 . 0 5 2	099910 70.000
2.265	- 8 . 3 4 7
+ 1 . 0 3 0	1.653
8.347 km	

He walked 1 km 653 m by foots.

15. Quantity of vegetable bought by Sameer =12 kg Quantity of onion = 3kg 500 g Quantity of tomato = 2 kg 175 g Quantity of potato = 12 kg - (3 kg 500g + 2 kg 175g) 3 . 5 0 0 kg + 2 . 1 7 5 kg 5 . 6 7 5 kg - 5 . 6

6 kg 325 g is the weight of potato.

Multiple Choice Questions (MCQs)

1. (a)	2. (d)	3. (b)	4. (b)	5. (a)	6. (C)
7. (b)	8. (a)	9. (c)	10. (c)	11. (c)	12. (b)

3.

 $\begin{array}{r} 0.600\\ 0.006\\ +6.060\\ \hline 6.666\end{array}$



Fill in the blanks

	1.	right	2. like	3. like	4. 0.0037
	5.	0.315	6. <u>65</u> 4	7.0.33	8. 15.015 litres
5.	0 - 0 0	4 . 3 Ø 0 . 0 3 5 . 3 1 5			



Exercise-7.1

1. Write the following using numbers, literals and signs of basic operations:

(i)
$$xy - 2$$
 (ii) $\frac{2x}{3} + 7$ (iii $3y - 2x$ (iv) $\frac{xy}{5} + 7$

- 2. Write the following using numbers, literals and signs of basic operations. State what each letter represents:
 - (i) x = y + z; SP = x, CP = y, Profit = z
 - (ii) P = 4x; P = Perimeter, x = side
 - (iii) x = y + z; Income = x, expenditure = y, saving = z
 - (iv) P = 2(I + b); P = perimeter, I = length, b = breadth
- 3. Let the number be x

Adding 7 to it we get x + 7On subtracting y

$$= (x + 7) - y$$

 $= x - y + 7$

4. Sumit spends daily = x



Monthly income = ` y Sumit earns in 30 days = ` y Sumit earn in 1 day = $\frac{y}{30}$ Sumit saves in 1 day = $\frac{y}{30} - x$ Sumit saves in 7 days = $7 \frac{y}{30} - x$ 5. No. of runs Rohit scored = xNo. of runs Virat scored = yTotal runs scored by them = x + yNo. of runs Rahul scored = 2(x + y) - 156. No. of rooms on the first floor = xNo. of rooms on the ground floor = (2x - 12)7. No. of rows of mango tree = 3xNo. of trees in each row = x^2 Total no. of trees in garden = $3x \times x^2$ $= 3x^{3}$ 8. Let the breadth be bm Length = (4b - 2) m 9. Let *n* denote the number of matchstick (i) 2n (ii) 5n (iii) 5n (iv) 2n (v) 6n

Exercise-7.2

1. Write the following in exponent form :

(i)
$$m^{6} \times n^{2} = m^{6}n^{2}$$

(ii) $a^{8} \times b^{5} = a^{8}b^{5}$
(iii) $\frac{3}{7} \times p^{3} \times (-q)^{2} \times r^{3} \times s = \frac{3}{7}p^{3}q^{2}r^{3}s$

- (iv) -x¹¹
- (v) $8 \times a^3 \times b^{12} \times c^7 = 8a^3b^{12}c^7$
- (vi) $-5 \times x^2 \times y^2 \times z \times w^3 = -5x^2y^2zw^4$
- 2. Following are in exponential form. Write them in product form.

 - (ii) $17 \times a \times a \times a \times a \times b \times b \times b$
 - (iii) $12 \times a \times b \times b \times c \times c \times c \times c$
 - (iv) $15 \times x \times x \times y \times y \times z$
 - (v) $4 \times x \times x \times x \times x \times x \times y \times y$ 12 times $\times z \times z$ 7 times.
 - (vi) $41 \times p \times p$ 10 times $\times q \times q$ 5 times $\times r \times r$ 7 times.
- 3. Write down each of the following in exponential form :

(i)	30 <i>a</i> ³ <i>b</i> ² c ⁴	(ii)	-48a ⁶ b ² c ⁷
(iii)	$6x^7 y^3 z^4$	(iv)	$24x^4y^3z^3$

4. Express the following in algebraic form :

(i) Volume =
$$l \times b \times h = x \times x \times x = x^3$$

(ii) Area = side × side

$$= a \times a = a^2$$

(iii) Length = x Breadth = $\frac{x}{3}$ Height = $\frac{x}{2}$ V = $l \times b \times h$

$$= x \times \frac{x}{3} \times \frac{x}{2} = \frac{x^3}{6}$$

5. Population of insects = x

Population of insects after 1 week = xy

Population of insects after 3 week = 3xy

6. No. of rows of chairs = x^2



No. of chairs in each row = y^3 No. of chair in x^2 rows = x^2y^3

- 7. No. of rows of benches = $3x^2$ No. of benches in each row = $2xy^3$ No. of students that can occupy one bench = yTotal number of students = $2xy^3 \times 3x^2 \times y$ = $6x^3y^4$
- 8. Cost of one item = $18x^2y$ No. of items = $2y^3$ Cost of $2y^3$ items = $18x^2y \times 2y^3$ = $36x^2y^4$
- 9. No. of pens Suhani purchased = 3xNo. of erasers Suhani purchased = 2yNo. of notebooks Suhani purchased = yCost of 1 pen = 2yCost of 3x pen = $3x \times 2y = 6xy$ Cost of 1 eraser = `xyCost of 2y erasers = ` $xy \times 2y$ $= 2xy^2$ Cost of 1 notebook = ` x^2y^3 Cost of xy notebook = ` $x^2y^2 \times xy$ = ` x^3y^4

Total amount paid = $xy + xy^2 + x^3y^4$

Multiple Choice Questions (MCQs)

1. (a)	2. (d)	3. (c)	4. (d)	5. (b)	6. (a)
7. (d)	8. (d)	9. (a)	10. (d)		



Fill in the blanks

1.	7w	2.	x = y + 7	3.	constant
4.	<i>z</i> – 2 <i>x</i>	5.	5x + 5	6.	x ¹³



Ratio and Proportion

Exercise-8.1

- 1. Express the following in the form of ratio :
 - (i) $\frac{1}{6}$ i.e., 1:6 (ii) $\frac{3}{2}$ i.e., 3:2 (iii) $\frac{80 \div 5}{75 \div 5} = \frac{16}{15}$ i.e., 16:15 (iv) Weight of Mohit = x

Weight of Rohit = 2xRatio $\frac{2x}{x}$ i.e., 2 : 1

2. Express the following ratios in the simplest form:

(i) $\frac{65 \div 13}{52 \div 13} = \frac{5}{4} = 5:4$ (ii) $\frac{48 \div 2}{60 \div 2} = \frac{24 \div 2}{30 \div 2} = \frac{12 \div 3}{15 \div 3} = \frac{4}{5} = 4:5$ (iii) $\frac{900 \div 100}{1500 \div 100} = \frac{9 \div 3}{15 \div 3} = \frac{3}{5} = 3:5$ (iv) $\frac{186 \div 31}{403 \div 31} = \frac{6}{13} = 6:13$ (v) $\frac{750 \div 50}{2000 \div 50} = \frac{15 \div 5}{40 \div 5} = \frac{3}{8} = 3:8$ (vi) $\frac{384 \div 4}{480 \div 4} = \frac{96 \div 4}{120 \div 4} = \frac{24 \div 2}{30 \div 2} = \frac{12 \div 3}{15 \div 3} = \frac{4}{5} = 4:5$

3. Find the ratio of the following in the simplest form :

(i) 80 paise : `3
= 80 paise : 300 paise
=
$$\frac{80 \div 10}{300 \div 10} = \frac{8 \div 2}{30 \div 2} = \frac{4}{15}$$

= 4 : 15
(ii) 220 days : 1 year
= 220 days : 365 days
= $\frac{220 \div 5}{365 \div 5} = \frac{44}{73}$
= 44 : 73
(iii) 4 m : 150 cm
400 cm : 150 cm
= $\frac{400 \div 50}{150 \div 50} = \frac{8}{3}$
= 8 : 3
(iv) 21 days : 4 weeks
= 21 days : 28 days
= $\frac{21 \div 7}{28 \div 7} = \frac{3}{4} = 3 : 4$
(v) 5 kg : 2 kg 500g
5000g : 2500 g
= $\frac{5000 \div 100}{2500 \div 100} = \frac{50 \div 25}{25 \div 25} = 2 : 1$
(vi) 750 ml : 10 litre
750 ml 10000 ml
 $\frac{750 \div 50}{10000 \div 50} = \frac{15 \div 5}{20 \div 5} = \frac{3}{4}$
= 3 : 4
(vii) 4 years : 6 months



48 months : 6 months $=\frac{48 \div 6}{6 \div 6} = \frac{8}{1}$ = 8 : 1 (viii) 48 min : 2 hour 40 min 48 min : 160 min $=\frac{48\div 4}{160\div 4}=\frac{12\div 4}{40\div 4}=\frac{3}{10}$ = 3 : 10 4. Compare the following ratios : 5: 12 and 3 : 8 (i) $=\frac{5\times2}{12\times2}=\frac{10}{24}$ $=\frac{3\times3}{8\times3}=\frac{9}{24}$ $=\frac{10}{24}>\frac{9}{24}$ $=\frac{5}{12}>\frac{3}{8}$ (ii) $\frac{15 \times 25}{16 \times 25} = \frac{375}{400}$ $=\frac{24\times16}{25\times16}=\frac{384}{400}$ $=\frac{375}{400} < \frac{384}{400} = \frac{15}{16} < \frac{24}{25}$ (iii) $\frac{2 \times 8}{7 \times 8} = \frac{16}{56}$ $=\frac{6\times7}{8\times7}=\frac{42}{56}$ $=\frac{16}{56} < \frac{42}{56} = \frac{2}{7} < \frac{6}{8}$ (iv) $\frac{11 \times 5}{14 \times 5} = \frac{55}{70}$

$$= \frac{2 \times 14}{5 \times 14} = \frac{28}{70}$$
$$= \frac{55}{70} > \frac{28}{70} = \frac{11}{14} > \frac{2}{5}$$

5. Write three equivalent ratios of each of the following :

(i) 6:15 $\frac{6 \times 2}{15 \times 2} = \frac{12}{30}, \frac{6 \times 3}{15 \times 3} = \frac{18}{45}, \frac{6 \times 4}{15 \times 4} = \frac{24}{60}$ Three equivalent ratios of 6 : 15 are 12:30,18:45,24:60 (ii) 4:9 $\frac{4 \times 2}{9 \times 2} = \frac{8}{18}, \frac{4 \times 3}{9 \times 3} = \frac{12}{27}, \frac{4 \times 4}{9 \times 4} = \frac{16}{36}$ Three equivalent ratios of 4 : 9 are 8:18,12:27,16:36 (iii) 1:7 $\frac{1 \times 2}{7 \times 2} = \frac{2}{14}, \frac{1 \times 3}{7 \times 3} = \frac{3}{21}, \frac{1 \times 4}{7 \times 4} = \frac{4}{28}$ Three equivalent ratios of 1:7 are 2:14, 3:21, 4:28 (iv) 5:9 $\frac{5 \times 2}{9 \times 2} = \frac{10}{18}, \frac{5 \times 3}{9 \times 3} = \frac{15}{27}, \frac{5 \times 4}{9 \times 4} = \frac{20}{36}$ Three equivalent ratios of 5 : 9 are 10 : 18, 15 : 27, 20 : 36. 6. Monthly income of a man = `12000 His expenditure = `7600 (i) Ratio of income to expenditure 12000 ÷100

7600 ÷100


$$= \frac{120 \div 4}{76 \div 4} = \frac{30}{19}$$

= 30 : 19
(ii) Ratio of income to saving
Saving = `12000 - 7600 = 4400
$$= \frac{12000}{4400}$$

$$= \frac{12000 \div 100}{4400 \div 100}$$

$$= \frac{120 \div 4}{44 \div 4} = \frac{30}{11}$$

= 30 : 11
7. Opening time of office = 9 a.m.
Closing time of office = 6 p.m.
Lunch interval = 45 minutes
Ratio of lunch interval to total period
$$= \frac{45 \div 5}{540 \div 5} = \frac{9 \div 9}{108 \div 9} = \frac{1}{12}$$

= 1 : 12
8. No. of boys in school = 840
No. of girls in school = 700
Total students = 1540
(i) Ratio of boys to the total students
$$= \frac{840 \div 10}{1540 \div 10} = \frac{84 \div 2}{154 \div 2} = \frac{42 \div 7}{77 \div 7} = \frac{6}{11}$$

= 6 : 11
(ii) Ratio of girls to the total students
$$= \frac{700 \div 10}{1540 \div 10} = \frac{70 \div 7}{154 \div 7} = \frac{10 \div 2}{22 \div 2} = \frac{5}{11}$$

9. Distance covered by car = 120 km



Time taken by car = 4 hours Speed = $\frac{d}{t}$ $=\frac{120 \text{ km}}{4 \text{ hr}}$ = 30 km/hrDistance covered by train = 150 km Time taken by train = 2 hours Speed = $\frac{d}{t}$ $=\frac{150 \text{ km}}{2 \text{ hr}}$ = 75 km/hrRatio = $\frac{30 \text{ km/hr}}{75 \text{ km/hr}}$ $=\frac{30\div5}{75\div5}=\frac{6\div3}{15\div3}=\frac{2}{5}$ = 2 : 5 10. No. of bulbs = 200 No. of defective bulbs = 45 No. of good bulbs = 200 - 45 = 155Ratio of defected bulbs to good bulbs (i) $=\frac{45\div5}{155\div5}=\frac{9}{31}$ = 9 : 31 Ratio of good bulbs to total bulbs (ii) $=\frac{155\div 5}{200\div 5}=\frac{31}{40}$ = 31 : 40 110 Brilliant Mathematics-6

Exercise-8.2

- 1. Which of the following are in proportion :
 - (i) Product of extremes = 16 × 18 = 288
 Product of means = 4 × 32 = 128
 Product of means Product of extremes 16, 4, 32, 18 are not in proportion.
 - (ii) Product of extremes = 12 × 12 = 144
 Product of means = 18 × 28 = 504
 Product of means Product of extremes 12, 18, 28, 12 are not in proportion.
 - (iii) Product of extremes = $15 \times 54 = 810$ Product of means = $15 \times 45 = 810$ Product of means = Product of extremes 15, 18, 45, 54 are in proportion.
 - (iv) Product of extremes = $30 \times 15 = 450$ Product of means = $25 \times 12 = 300$ Product of means Product of extremes 30, 25, 12, 15 are not in proportion.
- 2. Find *x* in the following proportions :

(i)
$$169: x :: 13: 1$$

 $\frac{169}{x} = \frac{13}{1}$
 $x = \frac{169 \times 1}{13} = 13$
(ii) $x: 3:: 57: 19$
 $\frac{x}{3} = \frac{57}{19}$
 $x = \frac{57 \times 3}{19} = 9$
(iii) $x: 210:: 20: 280$
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$$\frac{x}{210} = \frac{20}{280}$$

$$x = \frac{20 \times 210}{280} = 15$$
(iv) 18:24::3:x

$$\frac{18}{24} = \frac{3}{x}$$

$$x = \frac{3 \times 24}{18} = 4$$
3. Find the mean proportional between :
(i) Let x be the mean proportional between 4 and 9

$$x^{2} = 4 \times 9$$

$$x^{2} = 36$$

$$x^{2} = 6^{2} \qquad x = 6$$
(ii) Let x be the mean proportional between 25 and 81

$$x^{2} = 25 \times 81$$

$$x^{2} = 2025$$

$$x^{2} = 45^{2}$$

$$x = 45$$
(iii) Let x be the mean proportional between 12 and 48

$$x^{2} = 12 \times 48$$

$$x^{2} = 576$$

$$x^{2} = 24^{2}$$

$$x = 24$$
(iv) Let x be the mean proportional between 32 and 50

$$x^{2} = 40^{2}$$

$$x = 40$$

(v) Let *x* be the mean proportional between 45 and 80

$$x^{2} = 45 \times 80$$

 $x^{2} = 3600$
 $x^{2} = 60^{2}$
 $x = 60$

4. 25, 35 and *x* are in continued proportion 25, 35, 35, *x* are in proportion

$$= 25 : 35 : : 35 : x$$
$$\frac{25}{35} = \frac{35}{x}$$
$$x = \frac{35 \times 35}{25} = 49$$

- 5. Show that the following numbers are in continued proportion :
 - (i) 48, 60, 75

$$b^2 = ac$$

 $60^2 = 48 \times 75$
 $3600 = 3600$

Therefore, 48, 60 and 75 are in continued proportion.

- (ii) 3, 6, 12
 - $6^2 = 3 \times 12$ 36 = 36

Therefore 3, 6, 12 are in continued proportion.

(iii) 16, 8, 4

$$8^2 = 16 \times 4$$

64 = 64

Therefore 16, 8, 4 are in continued proportion.

(iv) 49, 56, 64

$$56^2 = 49 \times 64$$



3136 = 3136 Therefore 49, 56, 64 are in continued proportion. 49, 91, 169 (v) $91^2 = 49 \times 169$ 8281 = 8281 Therefore 49, 91, 169 are in continued proportion. 6. Let the second term be x 6 : *x* : : 24 : 44 $\frac{6}{x} = \frac{24}{44}$ $=\frac{44\times 6}{24}$ x = 116:11::24:44 7. Let the third term be x 32:112::*x*:217 $\frac{32}{112} = \frac{x}{217}$ $x = \frac{32 \times 217}{112} = 62$ 8. Let the breadth of rectangle be x cm Ratio of length to breadth = 6 : 3 Ratio of length to breadth = 80 : x 6:3 = 80:x $\frac{6}{3} = \frac{80}{x}$ $x = \frac{80 \times 3}{6} = \frac{240}{6} = 40 \,\mathrm{cm}$ Therefore, breadth = 40 cm

9. Let the quantity of besan be *x* kg

Ratio of sugar and besan = 1 : 3 Ratio of sugar and besan = 21 : x $\frac{1}{3} = \frac{21}{x}$ $x = 21 \times 3 = 63$ Quantity of besan = 63 kg. 10. Let the weight of mercury be x g Ratio of aluminium and mercury = 3 : 7 Ratio of aluminium and mercury = 2.10 : x $\frac{3}{7} = \frac{2.10}{x}$ $x = \frac{2.10 \times 7}{300} = 4.9$ Quantity of mercury = 4.9 g 11. Let the income of man be \hat{x} Ratio of income to his savings = 12 : 1 Ratio of income to his saving = x : 12500 $\frac{12}{1} = \frac{x}{12500}$ $x = 12500 \times 12 = 1,50,000$ His income per year = 1,50,000His income per month = $\frac{1,50,000}{12}$ = `12,500 12. Ratio of Maths book to Science book = Ratio of Science book to English book. No. of books in science = 450 No. of books in English = 300Let the number of maths book be x x:450::450:300



 $\frac{x}{450} = \frac{450}{300}$ $x = \frac{^{15}450 \times 450}{300} = 675$ Number of Maths book = 675 Exercise-8.3 1. Cost of 25 metres of cloth = `995.50 Cost of 1 metre of cloth = $\frac{995.50}{25}$ Cost of 5 metre of cloth = $\frac{995.50 \times 5}{25}$ =`199.1 2. Cost of 2 dozens pen = ` 384 Cost of 1 pen = $\frac{384}{24}$ Cost of 96 pens = $\frac{384}{24} \times 96$ =`1536 3. Cost of 8 kg rice = 120.60 Cost of 1 kg rice = $\frac{120.60}{8}$ Cost of 50 kg rice = $\frac{120.60 \times 50}{8}$ =`753.75 4. Worker earns 300 in days = 5 Worker earns 1 in days = $\frac{5}{800}$ Worker earns `1760 in days = $\frac{5}{800} \times 1760$ = 11 days 116 Brilliant Mathematics-6

- 5. No. of men required to assemble 8 machines = 20 No. of men required to assemble 1 machine = $\frac{20}{8}$ No. of men required to assemble 12 machines = $\frac{20 \times 12}{8}$ = 30 men
- 6. Cost of 84 km rail journey = 630Cost of 1 km rail journey = $\frac{630}{84}$ Cost of 136 km rail journey = $\frac{630 \times 136}{84}$ = 1020
- 7. Hours needed to filled 6 oil tankers by pipe = $4\frac{1}{2}$ hrs = $\frac{9}{2}$ hrs

Hours needed to fill 1 oil tanker by pipe = $\frac{\frac{7}{2}}{6}$

Hours needed to fill 4 oil tankers = $\frac{9}{2} \times 4$

 $=\frac{9}{12}\times4=3\,hrs$

8. Quantity of cereals consumption by 400 students = 5200 kg Quantity of cereals consumption by 1 student = $\frac{5200}{400}$ kg Quantity of cereals consumption by 400 + 260 *i.e.*, 660 students

$$=\frac{5200}{400}$$
 × 660 = 8580 kg

9. Time taken by car travelling at a speed of 60 km/hr



to reach fixed place =
$$5\frac{1}{2}$$
 hours
= $\frac{11}{2}$ hours

Time taken by car travelling at a speed of 1 km/h = $\frac{2}{60}$

11

Time taken by car travelling at a speed of 80 km/h

$$= \frac{11}{2 \times 60} \times 80$$
$$= 7\frac{1}{3}$$
 hours

10. Speed of aeroplane to travel a journey in 6 hours = 1260 km/h

Distance travelled by aeroplane = $s \times t$

$$= 1260 \times 6$$

$$= 7560 \text{ km}$$
Speed required to cover 7560 km in 5 hours
$$= \frac{d}{t}$$

$$= \frac{7560}{5}$$

$$= 1512 \text{ km/hr}$$
Increase in speed = 1512 km/hr - 1260 km/h

$$= 252 \text{ km/hr}$$
11. Food for 160 soldiers last for = 15 days
Food for 1 soldier last for = 15 × 160 days

$$= 2400 \text{ days}$$
Food for 200 soldiers last for
$$= \frac{2400}{200} = 12 \text{ days}$$
12. Amount a person can earn in 16 months = `80000



Amount a person can earn in 1 month = $\frac{80000}{16}$ Amount a person can earn in 7 months = $\frac{80000 \times 7}{16}$ (i) =`35000 `80000 is earned in months = 16 (ii) 1 is earned in months = $\frac{16}{80000} \times 215000$ = 43 months 13. Cost of 25 bags of sugar weighing 40 kg = 2750 Total weight 25 bags of sugar weighing 40 kg $= 25 \times 40 = 1000 \, \text{kg}$ Cost of 1000 kg of sugar = 2750 Cost of 1 kg of sugar = $\frac{2750}{1000}$ = 2.75 Total weight of 32 bags weighing 50 kg $= 32 \times 50 = 1600 \text{ kg}$ Cost of 1600 kg of sugar = 2.75 × 1600 =`4400 14. Distance covered by car in 8l of petrol = 128 km Distance covered by car in 1 l of petrol = $\frac{128}{g}$ = 16 km (i) Distance covered in 18l of petrol = 18 × 16 = 288 km Petrol required to cover 128 km = 8I (ii) Petrol required to cover 1 km = $\frac{8l}{128}$ Petrol required to cover 160 km = $\frac{8}{128} \times 160 = 10/$ 119 Brilliant Mathematics-6

15. Ramu finished work in = 6 days Raju finished work in = 3 days Total work = LCM (6 and 3) = 6 Ramu one day work = $\frac{6}{6}$ = 1 unit Raju one day work = $\frac{6}{3}$ = 2 unit

If they work together, works is finished in = $\frac{6}{(1+2)}$ = $\frac{6}{3}$ = 2 days

Multiple Choice Questions (MCQs)

	1. (a)	2. (c)	3. (a)	4. (d)	5.	(C)	6. (a)
	7. (d)	8. (d)	9. (b)	10. (b)	11.	(C)	12. (b)
1.	$\frac{40 \text{cm}}{100 \text{cm}} \div \frac{10}{10} = \frac{4}{10} \div \frac{2}{2} = \frac{2}{5}$						
	= 2 : 5						
2.	$\frac{2}{3} \times \frac{3}{3} = \frac{6}{9} = 6:9$						
3.	Product of	means = 3	$3 \times 20 = 60$				
	Product of	extremes	= 30 × 2 =	60			
	Product of means = Product of extremes						
	Therefore, 2, 3, 20, 30 are in proportion.						
4.	6:7						
5.	ad = bc						
6.	16, 24 , <i>x</i> , !	54					
	$16 \sqrt{51} = 2$	$1 \sim v$					

$$16 \times 54 = 24 \times x$$
$$x = \frac{16 \times 54}{24} = 36$$



7. Ratio of length to breadth = 3 : 1 breadth = 7 cm length = x cm 3 : 1 = *x* : 7 $\frac{3}{1} = \frac{x}{7}$ *x* = 21 cm 8. (3 + 4) = 7 (Antecedant in first term) (8 + 2) = 10 (consequent is second term) = 7 : 10 9. $b^2 = ac$ $b^2 = 25 \times 4$ $b^2 = 100$ *b* = 10 10. 11:1 11. 5:3 12. Sum of ratio = 3 + 2 = 5 A's share = $\frac{3}{5} \times 20 = 12$ pens B's share = $\frac{2}{5} \times 20 = 8$ pens (12, 8)Fill in the blanks 2. means 3. 4:1 1. division 4. 1 5. extremes 6. $b^2 = ac$ 7. `600 Number of article 8. 7. Total pencil = 25 × 12 = 300







- (ii) Scissor
- 6. From figure name:
 - (i) (p,q),(q,l),(q,m),(q,n),(p,l),(p,m),(p,n)
 - (ii) (*I*,*m*),(*m*,*n*),(*I*,*n*)
 - (iii) (E,F,G,A), (D,C,B,A)
 - (iv) p and n (v) q and m (vi) No
- 7. From figure name:

(i)	A,B,C,D,E	(ii)	AC,OE
(iii)	OA,OC,OE,OD	(iv)	(A,B,O,C)

8. Name the collinear points on each line segment :

(P, O, A), (C, O, R), (B, O, Q)

9. Answer the following questions:

(i) 2	(ii)	Infinite
(iii) non-collinear	(iv)	point

10. Fill in the blanks :

(iv) point

- (i) points (i
 - (ii) point(iii) indefinitely(v) point of intersection

(v) point of it

Exercise-9.2

- 1. How many line segments are there in the following figures? Name all of them.
 - (i) 5; *AB*,*BC*,*CD*,*DA*,*AC* (ii) 6; *AB*,*BC*,*CD*,*DA*,*AC*,*BD*
 - (iii) 5, *AB*,*BC*,*CD*,*DE*,*EA* (iv) 6; *AB*,*BC*,*CA*,*RQ*,*QP*,*PR*
- 2. Draw the line segment of following lengths with the help of a ruler :

Do yourself.

- 3. In figure name
 - (i) *PQ*,*QR*,*RS*,*SP*
 - (ii) PA, QB, SD, RC, PK
 - (iii) (*PQ*,*PS*),(*PQ*,*QR*),(*QR*,*RS*),(*PS*,*SR*)

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- (iv) (PQ, SR), (PS, QR)
- 4. Count the number of line segments and rays in figure3 line segments and 8 rays.
- 5. Pencil, edges of a paper.
- 6. /.8 cm

11.5 cm

Length of remaining segment = 3.7 cm

Multiple Choice Questions (MCQs)

1. (b)	2. (a)	3. (d)	4. (a)	5. (c)	6. (b)
7. (a)	8. (b)	9. (b)	10. (d)		

Fill in the blanks

10

- 1. parallel 2. intersection 3. equal
- 4. definite, two 5. AB
- 6. only one.



Exercise-10.1

1. Identify which are closed curves and which are open curves:



- 2. Name the points which are interior of the fig. and which are exterior to the fig.:
 - (i) Interior : A,B,C,F,J; Exterior : G,L,E,H,K
 - (ii) Interior : A, C, D, F, G, I; Exterior : B, H, J, M
- 3. Which of the following are polygons?

(i), (iii), (iv)

- 4. Fill in the blanks :
 - (i) simple (ii) sides (iii) diagonals
 - (iv) quadrilateral (v) convex (vi) closed figure
- 5. Illustrate, if possible, each one of the following with a rough diagram:



(ii) Not Possible





Exercise-10.2

- 1. Name all the angles formed in the following fig :
 - (i) AOB, BOC, AOC
 - (ii) PQR, PRQ, QPR
 - (iii) AOB, BOC, COD, AOC, AOD, BOD
 - (iv) ABC, ADC, BCD, BAD



2. In fig. list the points which are (i) in the interior of A (ii) in the exterior of A and (iii) on the A. (ii) *C*,*R* B_sS (iii) $P_{A}Q$ (i) 3. Identity the angle whose measures are given below as acute, zero, obtuse, complete, straight, right or reflex angle: (i) Obtuse (ii) Acute (iii) Right (iv) Acute (v) Obtuse (vi) zero (vii) Acute (viii) straight (x) complete (xi) reflex (ix) reflex (xii) reflex 4. How many degrees are three in the angles between the hour and minute hands of the clock when (i) 90° (ii) 0° (iii) 270° (iv) 180° Exercise-10.3 1. Name the types of following triangle : (i) Isosceles (ii) Isosceles right (iii) Equilateral (iv) Equilateral (v) Acute angled (vi) obtuse angled 2. Write by seeing the triangle : (i) A (ii) AC (iii) BC (iv) C 3. Check the possibility of a ABC with $A + B + C = 180^{\circ}$ $A = 50^{\circ}$ $B = 90^{\circ}$ (i) $C = 110^{\circ}$ A + B + C $50^{\circ} + 90^{\circ} + 110^{\circ} = 250^{\circ} > 180^{\circ}$ Not possible $A = 40^{\circ}$ $B = 65^{\circ}$ $C = 75^{\circ}$ (ii) A + B + C $40^{\circ} + 65^{\circ} + 75^{\circ} = 180^{\circ}$ Yes possible *A* = 125° $B = 35^{\circ}$ $C = 20^{\circ}$ (iii) $A + B + C = 180^{\circ}$ 126 Brilliant Mathematics-6

 $125^{\circ} + 35^{\circ} + 20^{\circ} = 180^{\circ}$

Yes possible

- 4. Answer the following by seeing the figure.
 - (i) AOD, ABD, ADC (ii) No,
 - (iii) COD, AOB, BOC, ABC, BCD
 - (iv) 8; AOB, BOC, COD, AOD, ABC, ADC, BCD, BAD
- 5. In the triangle shown in fig :
 - (i) *AP*,*CR*,*BQ* (ii) *O*
- 6. Fill in the blanks :
 - (i) 3,3 (ii) 3,6 (iii) One (iv) equilateral
 - (v) obtuse angled triangle (vi) one
- 7. True or false :

(iv)	False	(v)	False	((vi)	True
(i)	True	(ii)	False	((iii)	True

Exercise-10.4

- 1. Look at the figure and answer the following questions :
 - (i) 4; *AB*,*BC*,*CD*,*AD* (ii) *AB*,*BC*;*AB*,*AD*;*BC*,*CD*;*AD*,*CD*
 - (iii) *AB*,*CD*;*BC*,*AD* (iv) 2; *AC*,*BD*
 - (v) 4; *A*,*B*,*C*,*D*
- 2. Identify the following fig :
 - (i) Rectangle (ii) Square (iii) Rhombus
 - (iv) Parallelogram (v) Trapezium
- 3. Here diagonals are 11 cm and 12 cm No, it is not a rectangle as diagonals of quadrilateral are not equal but diagonals of rectangle are equal.
- 4. Write the similarities between :
 - (i) All sides are equal, diagonals bisect at right angle



- (ii) Opposite sides are parallel and equal.
- (iii) All angles are equal and both diagonals are also equal.
- (iv) Opposite sides are equal and diagonals bisect each other
- 5. True or False:
 - (i) True (ii) False (iii) False

(v) True

(iv) True

Exercise-10.5

1. In the given fig, identify :

(i)	0	(ii)	AB	(iii)	PQ
(iv)	0, R	(v)	AOCA	(vi)	ACBOA

- $(iv) O, R \qquad (v) AOCA \qquad (v)$
- 2. Define the following terms:
 - (i) Radius : The constant distance between the centre and any point on the circle is called the radius of the circle.
 - (ii) Chord : A line segment whose endpoints lie on a circle is called a chord of the circle.
 - (iii) Minor arc : If the arc is less than is half of the circle, it is called minor arc.
 - (iv) Segment : A segment is a part of a circle which is closed by a chord and its corresponding arc.
 - (v) Major sector : The sector made by the major arc is called the major sector of the circle.
 - (vi) Semi-circle :Half of a circle is called the semicircle.





Yes, the diameter is a part of semicircle.

5. Fill in the blanks :

(i)	half	(ii)	equal	(iii) arc
(iv)	unlimited	(v)	Diameter	

- 6. True or false :
 - (i) True(iv) True
- (ii) False (v) True
- (i

(iii) False

Multiple Choice Questions (MCQs)

1. (c)	2. (a)	3. (b)	4. (c)	5. (b)	6. (a)
7. (d)	8. (a)	9. (d)	10. (b)	11. (c)	12. (b)

Fill in the blanks

- 1. half 2. 6 3. 2 4. diameter
- 5. circumference
- 6. triangle
- 7. median
- 8. acute angled

Curves and P olygons

Exercise-11.1

1. Fill in the blanks :

11

- (i) Sphere (ii) 6, 12, 8 (iii) sphere (iv) 6
- (v) 5,8 (vi) circular pipe

(vii) cylinder

, 0 (0



(viii) rectilinear, triangle

- 2. Match the following :
 - (a) A jocker's cap (i) Cone
 - (b) A dice
 - (c) A cricket ball
 - (d) A coke can
- (iv) Cylinder
- (e) A kaleidoscope
- (v) Prism
- (f) A match box (v
- (vi) Cuboid

(ii) Cube

(iii) Sphere

3. Complete the following table :

	Shape	Edges	Vertices	Faces
а	Cuboid	12	8	6
b	Cube	12	8	6 square
С	Cylinder	2	No	Two circular
d	Cone	One	One	2 (1 plane, 1 curved)
е	Sphere	No	No	1 curved
f	Triangular Prism	9	6	5 (2 bases, 3 lateral)
g	Triangular Pyramid	6	4	4 (1 base, 3 lateral)
h	Square pyramid	8	5	5 (1 base, 4 lateral)

Multiple Choice Questions (MCQs)

1. (a)	2. (a)	3. (c)	4. (d)	5. (b)	6. (d)
7. (a)	8. (c)	9. (b)	10. (c)	11. (d)	12. (b)



Fill in the blanks

1.	2, 1, 1	2.	cuboid,	cube 3.4	4. edge
5.	cylinder	6.	height	7. square	8.10



Exercise-12.1

1. Which of these are symmetrical?



2. Among the alphabets given below, choose the ones which are symmetrical:



3. Draw line of symmetry for the following figures.







- 7. Write T for true and F for false:
 - (i) True (ii) True
- (iii) False
- (iv) False (v) True
- 8. Use a mirror to find if the dotted line is a line of symmetry :
 - (A) Yes (B) No (C) Yes
 - (D) Yes (E) Yes (F) Yes



9. Complete the table :

	Shape	Figure	No. of line of Symmetry
(i)	Square		4
(ii)	Angle		1
(iii)	Rhombus		2
(iv)	Line		infinite
(v)	Rectangle		2
(vi)	Circle	\bigcirc	infinite
(vii)	Equilateral Triangle		3

Multiple Choice Questions MCQs

1. (c)	2. (d)	3. (d)	4. (a)	5. (b)	6. (a)
7. (c)	8. (C)	9. (b)	10. (d)		

Fill in the blanks

- 1. rotational
- 2. one
- 3. No
- 4. opposite
- 5. line of symmetry
- 6. infinite number of



13

Mensuration

Exercise-13.1

- 1. Find the perimeter of the following figures:
 - (i) Perimeter = sum of length of all sides
 = 3 cm + 3 cm + 1 cm + 1 cm + 4 cm + 4 cm + 1 cm
 = 17 cm
 - (ii) Perimeter = sum of length of all sides
 - = 6 cm + 1 cm + 1 cm + 2.5 cm + 2.5 cm + 6 cm + 6 cm
 - + 6 cm + 6 cm + 1 cm + 1 cm + 13 cm
 - = 52 cm
 - (iii) Perimeter = sum of length of all sides
 - = 5 cm + 5 cm + 5 cm + 6 cm + 5 cm + 15 cm + 5 cm
 - + 5 cm + 6 cm + 5 cm + 5 cm + 15 cm
 - = 82 cm
 - (iv) Perimeter = sum of length of all sides
 = 4.5 cm + 4.5 cm + 1.5 cm + 1.5 cm + 5 cm + 5 cm + 1.5 cm + 1.5 cm + 4.5 cm
 - = 34 cm
- 2. Find the perimeter of rectangle whose
 - (i) L = 12 cm B = 8 cmPerimeter of rectangle = 2(I + b)= 2(12 + 8) cm= 2(20) cm= 40 cm(ii) L = 30 cm B = 16 cm
 - Perimeter = 2(l + b)**134** Brilliant Mathematics-6

= 2(30 + 16) cm = 92 cm 3. Find the perimeter of square whose side is (i) Side = 32 cm Perimeter of square = 4 × side $= 4 \times 32 \, \text{cm}$ = 128 cm (ii) Side = 12.5 cm Perimeter of square = $4 \times$ side = 4 × 12.5 cm = 50 cm 4. Find the perimeter of equilateral triangle whose side is (i) Side = 17.25 cm Perimeter of equilateral triangle = $3 \times side$ = 3 × 17.25 cm $= 51.75 \, \text{cm}$ (ii) Side = 40 cmPerimeter of equilateral triangle = $3 \times side$ $= 3 \times 40 \, \text{cm}$ = 120 cm 5. Find the perimeter of triangle whose sides are (i) Perimeter of triangle = sum of all sides = 12 cm + 12 cm + 10 cm = 34 cm Perimeter of triangle = sum of all sides (ii) = 13 cm + 12 cm + 5 cm= 30 cm 6. Find the perimeter of Perimeter of regular pentagon = $5 \times side$ (i) 135 Brilliant Mathematics-6

 $= 5 \times 10 \text{ cm}$ = 50 cm (ii) Perimeter of regular hexagon = 6 × side $= 6 \times 6.5 \, \text{cm}$ = 39 cm (iii) Perimeter of regular octagon = 8 × side $= 8 \times 2.5 \, m$ = 20 m 7. Perimeter of rectangle = 60 cm Let the breadth be bcm Length = 2bcm Perimeter = 2(l + b)60 cm = 2(2*b* + *b*) = 2(3*b*) 60cm = 6*b* $b=\frac{60}{6}$ cm $b = 10 \, \text{cm}$ $I = 2 \times b$ $= 2 \times 10 \text{ cm}$ = 20 cm 8. Perimeter of regular hexagon = 60 cm $6 \times side = 60 cm$ side = $\frac{60}{6}$ cm side = 10 cm9. Length of the wire = 120 cmPerimeter of square = 120 cm $4 \times side = 120 cm$



side = $\frac{120}{4}$ cm = 30 cm 10. Complete the following table-(i) Perimeter of square = 500 cm $4 \times side = 500 cm$ side = $\frac{500}{4}$ cm = 125 cm I = 125 cm b = 125 cm $I = 25 \,\mathrm{cm} P = 80 \,\mathrm{cm}$ (ii) Perimeter of rectangle = 2(I + b)80 = 2(25 + *b*) cm $\frac{80}{2} = (25 + b) \text{ cm}$ $40 = (25 + b) \, \mathrm{cm}$ $b = 40 - 25 \,\mathrm{cm} = 15 \,\mathrm{cm}$ (iii) b = 12 cm P = 140 cmPerimeter of rectangle = 140 cm $2(l + b) = 140 \,\mathrm{cm}$ $2(I + 12) = 140 \,\mathrm{cm}$ $I + 12 = \frac{140}{2}$ cm $I + 12 = 70 \, \text{cm}$ I = 70 cm - 12 cm = 58 cm11. Length of rectangular field be 7xBreadth of rectangular field be 5x Length = 70 m 70 m = 7*x* 137 Brilliant Mathematics-6

 $\frac{70}{7} = x$ 10 = *x* Breadth = $5 \times x$ $= 5 \times 10 = 50 \,\mathrm{m}$ Perimeter of rectangular field = 2(I + b)= 2(70 + 50) m= 2(120) m = 240 m Cost of fencing per m = 10Cost of fencing 240 m = 10 × 240 m =`2400 12. Rohan has to cover = 800 m Length of the field = 30 mBreadth of the field = 20 m Perimeter = $2 \times (I + b)$ $= 2 \times (30 \text{ m} + 20 \text{ m})$ = 2 × (50) m = 100 m No. of times he run around the field = $\frac{800 \text{ m}}{100 \text{ m}}$ = 8 times. 13. No. of rounds Kamal take = 5 Length of rectangular field = 250 m Breadth of rectangular field = 200 m Perimeter = $2 \times (I + b)$ = 2(250 + 200) m= 2(450) m = 900 m Kamal covered distance = $900 \text{ m} \times 5$ 138 Brilliant Mathematics-6

= 4500 m No. of rounds Saroj take = 5 Side of square park = 230 m Perimeter = $4 \times side$ $= 4 \times 230 \, \text{m}$ = 920 m Saroj covered distance = 920m×5 $= 4600 \, \text{m}$ Difference = (4600 - 4500) m = 100 m Saroj covered more than Kamal by 100 m. 14. Length of rectangular table = 3.5 mBreadth of rectangular table = 2 cm Perimeter = $2 \times (I + b)$ $= 2 \times (3.5 + 2) \text{ m}$ $= 2 \times (5.5) \,\mathrm{m}$ = 11 m Cost of lace per meter = `8 Cost of 11 m lace = `8 × 11 = `88 15. Perimeter = 2(I + b)18 = 2(I + b) $\frac{18}{2} = (l + b)$ 9 = (I + b)Since the sides are positive integers in cm (1, 8) (2, 7) (3, 6) (4, 5) cm Each pair represents a unique rectangle There are 4 different rectangles that can be drawn with a perimeter of 18 cm.



Exercise-13.2

1. Find the area of the rectangle, whose *b* = 10 cm (i) *I* = 18 cm Area of rectangle = $I \times b$ $= (18 \times 10) \text{ cm}^2$ $= 180 \text{ cm}^2$ *I* = 27 cm $b = 22 \,\mathrm{cm}$ (ii) Area of rectangle = $(I \times b)$ $= (27 \times 22) \text{ cm}^2$ $= 594 \text{ cm}^2$ (iii) I = 17.5 cm*b* = 8.4 cm Area of rectangle = $(I \times b)$ = 17.5 cm × 8.4 cm $= 147 \text{ cm}^2$ (iv) $I = 30 \, \text{cm}$ *b* = 22 cm Area of rectangle = $I \times b$ $= (30 \times 22) \text{ cm}^2$ $= 660 \text{ cm}^2$ 2. Find the area of the square, whose side are as follows : (i) Side = 6.5 cmArea of square = side × side $= (6.5 \times 6.5) \text{ cm}^2$ $= 42.25 \text{ cm}^2$ (ii) side = 125 cm Area of square = side × side = 125 cm × 125 cm $= 15625 \text{ cm}^2$



(iii) side = 110 cm Area of square = side × side = 110 cm × 110 cm $= 12100 \text{ cm}^2$ (iv) side = 36 m Ara of square = side × side = 36 m × 36 m $= 1296 \text{m}^2$ 3. Length of rectangle = 22 cm Breadth of rectangle = 16 cm Area = $I \times b$ = 22 cm × 16 cm $= 352 \text{ cm}^2$ Side of quare = 14 cm $Area = side \times side$ = 14 cm × 14 cm $= 196 \text{ cm}^2$ Difference = 352 cm² - 196 cm² $= 156 \text{ cm}^2$ Square has smaller area by 156 cm². 4. What happens to the area of square when its side is Let the side of square = a(i) Area = a^2 Doubled the side = 2a $Area = (2a)^2$ $= 4a^{2}$ Area becomes four times.

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(ii) If side is halved = $\frac{a}{2}$ Area = $\frac{a}{2}^2$ Area = $\frac{a^2}{4} = \frac{a^2}{4}$ Area becomes one fourth. (iii) If side is tripled = 3aArea = $(3a)^2$ $= 9a^{2}$ Area become nine times. 5. Perimeter of square field = 60 m $4 \times side = 60$ side = $\frac{60}{4}$ m = 15 m Area = side × side = 15 m × 15 m $= 225 \text{ m}^2$ 6. Length of rectangle = 24 cm Perimeter of rectangle = 88 cm $2(l + b) = 88 \,\mathrm{cm}$ 2(24 + *b*) = 88 $24 + b = \frac{88}{2}$ cm $24 + b = 44 \,\mathrm{cm}$ $b = 44 \,\mathrm{cm} - 24 \,\mathrm{cm}$ = 20 cm Area of rectangle = $I \times b$ $= 24 \text{ cm} \times 20 \text{ cm}$ 142 Brilliant Mathematics-6 $= 480 \text{ cm}^2$

7. Side of tile = 30 cm Area of tile = 30 cm × 30 cm = 900 cm² = $\frac{900}{100 \times 100}$ = 0.09m² Side of floor = 1.5 m Area of floor = 1.5 m × 1.5 m = 2.25m² No. of tiles = $\frac{\text{Area of floor}}{\text{Area of tile}}$ = $\frac{2.25m^2}{0.09m^2}$ = 25 8. Let the length of rectangular plot be 5x

Let the breadth of rectangular plot be 3x

Area of plot = 2940m²

$$l \times b = 2940 \text{ m}^2$$

 $5x \times 3x = 2940 \text{ m}^2$
 $15x^2 = 2940$
 $x^2 = \frac{2940}{15}$
 $x^2 = 196$
 $x = \sqrt{196}$
 $x = 14$
 $l = 5 \times x = 5 \times 14 = 70 \text{ m}$
 $b = 3 \times x = 3 \times 14 = 42 \text{ m}$
Perimeter = $2(l + b)$
 $= 2(70 \text{ m} + 42 \text{ m})$
 $= 2(112 \text{ m})$
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= 224 m Cost of fencing per m = $^{6.50}$ Cost of fencing 224 m = 6.50×224 =`1456 9. Length of floor = 5 mBreadth of floor = 4 m Area of floor = $I \times b$ $=5m \times 4m$ $= 20 m^2$ Side of square carpet = 3 m Area of square carpet = side × side = 3m× 3m $=9m^{2}$ Area of the floor that is not covered $= 20m^2 - 9m^2$ $= 11 m^{2}$ 10. Length of brick = 25 cm Breadth of brick = 12 cmArea of brick = $I \times b$ = 25 cm × 12 cm $= 300 \text{ cm}^2$ Length of court = 30 m Breadth of court = 20 m Area of court = $I \times b$ $= 30 \text{m} \times 20 \text{m}$ $= 600 \text{ m}^2$ $= 600000 \text{ cm}^2$


No. of bricks = $\frac{\text{Area of court}}{\text{Area of brick}}$ $=\frac{6000000\,\text{cm}^2}{300\,\text{cm}^2}$ = 20,00011. Let the width of rectangular field be x Length of rectangular field = 4xArea of rectangular field = 30976 cm² $Area = 30976 cm^2$ $l \times b = 30976 \, \text{cm}^2$ $x \times 4x = 30976$ $4x^2 = 30976$ $x^2 = \frac{30976}{4}$ $x^2 = 7744$ X = 88Length = $88 \times 4 = 352$ cm Breadth = 88 cm Perimeter = 2(l + b)= 2(352 + 88) cm = 880cm 12. Breadth of rectangle = 40 cmSide of square = 60 cmArea of square = $60 \text{ cm} \times 60 \text{ cm}$ $= 3600 \text{ cm}^2$ Area of rectangle = Area of square $l \times b = side \times side$ $1 \times 40 \,\mathrm{cm} = 3600 \,\mathrm{cm}^2$ 145 Brilliant Mathematics-6 $I = \frac{3600 \text{ cm}^2}{40 \text{ cm}} = 90 \text{ cm}$

13. Find the area of the following figures :



$$= 8m \times 4m$$
$$= 32m^{2}$$
Total Area = 16m² + 64m² + 32m²
$$= 112m^{2}$$
14. Length of room = 4 m
Breadth of room = 3 m
Area of room = $l \times b$
$$= 4m \times 3m$$
$$= 12m^{2}$$
Side of square tile = 0.5 m
Area of square tile = 0.5 m × 0.5 m
= 0.25 m²No. of tiles required = $\frac{12m^{2}}{0.25m^{2}}$ = 48

Multiple Choice Questions (MCQs)

1.	(a)	2.	(C)	3.	(d)	4.	(b)	5.	(C)	6.	(d)
7.	(b)	8.	(c)	9.	(a)	10.	(b)	11.	(a)	12.	(d)

- 1. equal
- 2. Side of square park = 50 m

Perimeter of square park = 4 × side

 $= 4 \times 50 \text{ m}$

Aslam will travel = 3×200 m

3. Side of square = $\frac{a}{2}$



Area = side × side

$$= \frac{a}{2} \times \frac{a}{2}$$
$$= \frac{a^2}{4}$$

Area becomes one fourth

- 4. Length of rectangular field = 34 m Width of rectangular field = 18 m Area = $I \times b$ = 34m×18m $= 612 \text{ m}^2$ Cost of cultivating per $m^2 = 4.50$ Cost of cultivating $612 \text{ m}^2 = 612 \times 4.50$ =`2754 5. Perimeter of square = Area of square

```
4 \times \text{side} = \text{side} \times \text{side}
        4 \times x = x \times x
       \frac{4 \times \cancel{x}}{\cancel{x}} = x
            x = 4
     Side = 4
6. Perimeter of square = 36 cm
     4 \times side = 36 cm
           side = \frac{36 \text{ cm}}{4}
                  = 9 cm
     Area of square = side × side
                              = 9 \text{ cm} \times 9 \text{ cm}
                              = 81 cm^{2}
                                                48 Brilliant Mathematics-6
```

7. L = xB = xPerimeter = 2(l + b)= 2(x + x)= 2(2x)=4xLength= 2x Breadth = 2xPerimeter = 2(I + b)= 2(2x + 2x)= 2(4x)= 8*x* Hence, its perimeter doubles. 8. Length of diagonal of square = 20 cm $(20)^2 = x^2 + x^2$ $(20)^2 = 2x^2$ 20 cm $400 = 2x^2$ Х $\frac{400}{2} = 200$ Χ $200 = x^2$ $x = \sqrt{200}$ $x = 10\sqrt{2}$ cm Perimeter = $4 \times side$ $= 4 \times 10\sqrt{2}$ $= 40\sqrt{2} \text{ cm}$ 9. Area of rectangle = 240 cm^2 Length of rectangle = 20 cm



Breadth of rectangle = $\frac{\text{Area}}{\text{Length}}$ $=\frac{240\text{cm}^2}{20\text{cm}}$ = 12 cm 10. Side of square park = 300 m Perimeter of square park = 4 × side $= 4 \times 300 \, \text{m}$ = 1200 m Cost of fencing per meter = `20 Cost of fencing 1200 m = `20 × 1200 =`24000 11. Side of equilateral triangle = 9 cm Perimeter of equilateral triangle = 3 × side $= 3 \times 9 \text{ cm}$ = 27 cm 12. Length = 6xBreadth = 5xPerimeter = 88 cm $2(l + b) = 88 \,\mathrm{cm}$ $2(6x + 5x) = 88 \,\mathrm{cm}$ $11x = \frac{88}{2}$ cm 11x = 44 cm $x = \frac{44}{11} \,\mathrm{cm}$ = 4 cm Length = 6x $= 6 \times 4 \text{ cm} = 24 \text{ cm}$ 150 Brilliant Mathematics-6

Fill in the blanks

- 1. perimeter
- length 2. 5. one-fourth
- 3. square unit

five

area 14

4.

Data Handling

6.

Exercise-14.1

- 1. Define the following terms:
 - Raw Data : The data obtained in the original form is (i) called raw data or ungrouped data.
 - (ii) Frequency of an Observation: The number of times a particular observartion occurs is called its frequency.
 - (iii) Frequency Distribution : From the supposed example given in the introductory part, we observe that

56 occurs 2 times				
42 occurs 6 times				
80 occurs 1 time				
63 occurs 8 times				
87 occurs 5 times				
The frequency of 80 is 1;				
The frequency of 56 and 74 is 2;				
The frequency of 84 is 3;				
The frequency of 37 and 45 is 4;				
The frequency of 62 and 87 is 5;				
The frequency of 42 is 6;				
The frequency of 63 is 8;				



We may represent the above data in a tabular form showing the frequency of each observation. This tabular form of representation is called frequency distribution table.

(iv) Arrayed Data : We may organise the above data in ascending or descending order is called arrayed data.

2.

Marks	Tally marks	Frequency
2		4
8		1
12		5
17		4
19		3
21		3
33		4
40		3
41		3

2		
J.	Ι.	

Wages	Tally marks	Frequency
50	UH I	6
55	UH II	7
60	UH UHI	11
65	W1111	9
70	WII	7



Outcome	Tally marks	Frequency	
1		3]
2	LH1 I	6	
3		9	
4	L HIII	7	
5		2	
6		3	
Marks	Tally marks	Frequency]
40		3	1
41	LH1 I	6	
42	L III	7	
43	L III	5	
44	LH11	7	
45		3	
46		3	
47		1	
Size	Tally marks	Frequency]
4	LH1	5	1
5		4	
6		11	
7		6	
8		4	
(i) 6	(ii) 5 and	8 (iii)	10

7		
1	٠	

Yearly Flight	Tally marks	Frequency
1055		6
1056		5
1476		1
1578		1
2001		2
2018		1
2033		1
2044		5
2046		3
2048		3
2255		2

(d) Range = Max value – Min value = 2255 – 1055 = 1200

- (iii) Range = Max value Min value = 35 – 24 = 11 kg
- (iv)___

Weight	Tally marks	Frequency
24		1
25		2
28		2
29		2



4
2
3
1
3

Exercise 14.2

- 1. (i) 800 (ii) 100 (iii) English (iv) Maths
- 2. 6 = 400 bicycles

City	Number of bicycles sold
Delhi	杨杨杨
Mumbai	50 50 50 50 50
Kolkata	杨杨
Banglore	මේ මේ මේ මේ මේ
Chandi-garh	杨杨杨杨杨
Lucknow	50 50 50 50

3. (a) 5

(b) June

- (c) 6 + 4 + 3 = 13 days (d) 7 3 = 4 days
- (e) April and September (f) June
- (g) April and September
- 4. = 10 animals

Village	Number of animals
А	અં અં અં અં અં અં અં અ
В	છતું છતું છતું છતું છતું છતું છતું છતું. છતું છતું છતું છતું છતું છતું છતું







