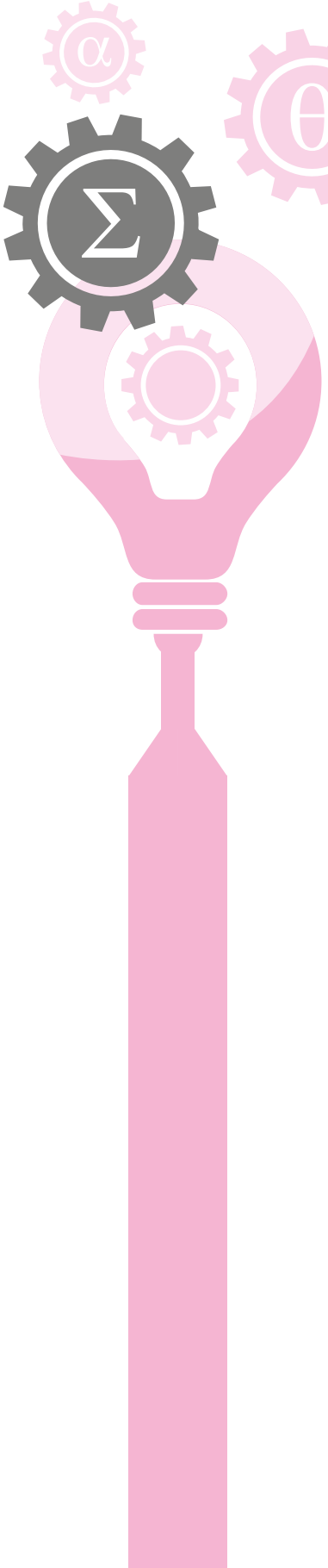

Contents

CHAPTER

1 RATIONAL NUMBERS

MATHEMATICAL REASONING

1. Divide the sum of $\frac{65}{12}$ and $\frac{12}{7}$ by their difference.

(A) $\frac{599}{311}$ (B) $\frac{680}{216}$ (C) $\frac{642}{133}$ (D) $\frac{501}{301}$

2. The sum of the additive inverse and multiplicative inverse of $\frac{1}{5}$ is _____.

(A) $\frac{24}{5}$ (B) $-\frac{24}{5}$ (C) 25 (D) –25

3. The product of two rational numbers is $\frac{-28}{81}$. If one of the numbers is $\frac{14}{27}$, then find the other number.

(A) $\frac{2}{5}$ (B) $\frac{8}{17}$ (C) $-\frac{2}{3}$ (D) $-\frac{4}{3}$

4. If $a = 7$, then the value of $-\left(\frac{1-2a}{a-5}\right)$ is _____.

(A) $-\frac{13}{2}$ (B) $-\frac{15}{2}$ (C) $\frac{13}{2}$ (D) $\frac{15}{2}$

5. Which of the following statements is TRUE?

(A) Every point on the number line represents a rational number.

(B) The product of a rational number and its reciprocal is 0.

(C) $(17 \times 12)^{-1} = 17^{-1} \times 12$

(D) Reciprocal of $\frac{1}{a}$, $a \neq 0$ is a.

6. The multiplicative inverse of $-\frac{a}{b}$ is _____.

(A) $\frac{a}{b}$ (B) $\frac{b}{a}$

(C) $-\frac{b}{a}$ (D) None of these

7. Which of the following properties of rational numbers is given below?

$$\frac{7}{4}\times\left(\frac{-8}{3}+\frac{-13}{12}\right)=\frac{7}{4}\times\frac{-8}{3}+\frac{7}{4}\times\frac{-13}{12}.$$

(A) Commutativity of addition

(B) Associativity of multiplication

(C) Distributivity of multiplication over addition

(D) Distributivity of addition over multiplication

8. If $x=\frac{2+3\times2}{-5}$, then $|-x|$ is equal to _____.

(A) $\frac{8}{5}$ (B) $-\frac{8}{5}$ (C) 0 (D) 1

9. Which of the following options is true ?

(A) $\frac{5}{7}<\frac{7}{9}<\frac{9}{11}<\frac{11}{13}$ (B) $\frac{11}{13}<\frac{9}{11}<\frac{7}{9}<\frac{5}{7}$

(C) $\frac{5}{7}<\frac{11}{13}<\frac{7}{9}<\frac{9}{11}$ (D) $\frac{5}{7}<\frac{9}{11}<\frac{11}{13}<\frac{7}{9}$

10. The rational number which is not lying between $\frac{5}{16}$ and $\frac{1}{2}$ is _____.

(A) $\frac{3}{8}$ (B) $\frac{7}{16}$ (C) $\frac{1}{4}$ (D) $\frac{13}{32}$

11. Simplify : $\left(\frac{3}{11}\times\frac{5}{6}\right)-\left(\frac{9}{12}\times\frac{4}{3}\right)+\left(\frac{5}{13}\times\frac{6}{15}\right)$

(A) $-\frac{177}{286}$ (B) $-\frac{303}{40}$ (C) $\frac{289}{492}$ (D) $\frac{17}{24}$

12. What should be subtracted from $\left(\frac{3}{4}-\frac{2}{3}\right)$ to get $\frac{-1}{6}$?

(A) $-\frac{6}{13}$ (B) $\frac{1}{4}$ (C) $\frac{2}{7}$ (D) $-\frac{1}{8}$

13. Simplify : $\frac{3}{8}+\frac{7}{2}+\left(\frac{-3}{5}\right)+\frac{9}{8}+\left(\frac{-3}{2}\right)+\frac{6}{5}$.

(A) $\frac{-2}{3}$ (B) $\frac{-41}{10}$ (C) $\frac{39}{5}$ (D) $\frac{41}{10}$

14. If $x=\frac{2}{3}$ and $y=\frac{3}{2}$, then find the value of $(x + y) \div (x - y)$.

(A) $\frac{15}{2}$ (B) $-\frac{13}{5}$ (C) $\frac{17}{6}$ (D) $-\frac{11}{6}$

15. If $x=-\frac{4}{11}$, then which of the following rational number lies between x and $|x|$?

(A) $\frac{7}{13}$ (B) $-\frac{11}{15}$ (C) $-\frac{2}{11}$ (D) $\frac{5}{8}$

EVERYDAY MATHEMATICS

16. There are 42 students in a class. Out of these, $\frac{3}{4}$ of the boys and $\frac{2}{3}$ of the girls come to school by bus. The total number of boys and girls of the same class who come to school by bus is 30. How many boys are there in the class?

(A) 20 (B) 24 (C) 26 (D) 16

17. Mrs Priya earns ₹ 18000 per month. She spends $\frac{7}{12}$ on household items and $\frac{1}{8}$ on rest of the things. The amount she saves is _____.

(A) ₹ 7120 (B) ₹ 5250
(C) ₹ 5520 (D) ₹ 6562.50

18. One fruit salad recipe requires $\frac{1}{2}$ cup of sugar. Another recipe for the same fruit salad requires 2 tablespoons of sugar. If 1 tablespoon is equivalent to $\frac{1}{16}$ cup, then how much more sugar does the first recipe require?

(A) $\frac{4}{5}$ cup (B) $\frac{6}{5}$ cup
(C) $\frac{3}{8}$ cup (D) $\frac{5}{8}$ cup

19. The wingspans of different species of birds is given below.

Species of birds	Blue jay	Golden eagle	Seagull	Albatross
Length of wingspans	$\frac{41}{100}$ m	$2\frac{1}{2}$ m	$1\frac{7}{10}$ m	$3\frac{3}{5}$ m

How much longer is the wingspan of a Golden eagle than the wingspan of a Blue jay?

(A) $\frac{209}{100}$ cm (B) $\frac{209}{100}$ m
(C) $\frac{9}{100}$ m (D) $\frac{215}{100}$ cm

20. There are few adults and children in a restaurant. If $\frac{3}{8}$ of the people in the restaurant are adults and there are 90 more children than adults, then how many children are there in the restaurant?

(A) 180 (B) 200 (C) 225 (D) 230

ACHIEVERS SECTION (HOTS)

21. Which of the following options is INCORRECT?

(A) The rational number 0 is the additive identity for rational numbers.

(B) The additive inverse of the rational number a/b is $-a/b$ and vice-versa.

(C) Rational numbers are closed under the operations of subtraction, multiplication and division.

(D) There are infinite rational numbers between any two rational numbers.

22. Match the following.

	Column-I	Column-II
(P)	Product of a rational number and its reciprocal is	(i) –1
(Q)	If $\frac{12}{30}$ and $\frac{x}{5}$ are equivalent, then x =	(ii) 0
(R)	$\left[\frac{8}{21} \div \left(\frac{-32}{39} \div \frac{16}{13}\right)\right] \times \frac{7}{4} =$	(iii) 2
(S)	Sum of a rational number and its additive inverse is	(iv) 1

(A) (P) → (iv); (Q) → (iii); (R) → (i); (S) → (ii)
(B) (P) → (i); (Q) → (iii); (R) → (iv); (S) → (ii)
(C) (P) → (iv); (Q) → (iii); (R) → (ii); (S) → (i)
(D) (P) → (i); (Q) → (iv); (R) → (iii); (S) → (ii)

23. Fill in the blanks.
(i) 0 is neither **P** nor **Q**.
(ii) **R** has/have no reciprocal.
(iii) The rational numbers **S** and **T** are equal to their reciprocal.

	P	Q	R	S	T
(A)	Positive	negative	1	1/2	–1/2
(B)	Integer	rational	0	–1	0
(C)	Positive	negative	0	1	–1
(D)	Natural	integer	–1	1	–1

24. Which of the following options holds?
Statement - 1 : Rational numbers are closed under division.
Statement - 2 : The value of $\left(\frac{-7}{18} \times \frac{15}{-7}\right) - \left(1 \times \frac{1}{4}\right) + \left(\frac{1}{2} \times \frac{1}{4}\right)$ is $\frac{17}{24}$.
(A) Both Statement - 1 and Statement - 2 are true.
(B) Statement - 1 is true and Statement - 2 is false.
(C) Statement - 1 is false but Statement - 2 is true.
(D) Both Statement - 1 and Statement - 2 are false.

25. State 'T' for true and 'F' for false.
(i) The rational number $\frac{-8}{-3}$ lies neither to the right nor to the left of zero on the number line.
(ii) The rational numbers $\frac{1}{2}$ and $-\frac{5}{2}$ are on the opposite sides of 0 on the number line.
(iii) 0 is the smallest rational number.
(iv) For every rational number x, $x + 1 = x$.

	(i)	(ii)	(iii)	(iv)
(A)	F	T	T	F
(B)	T	F	F	F
(C)	F	T	F	F
(D)	T	T	F	F

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Darken your choice with HB Pencil

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	8.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	15.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	22.	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	16.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	23.	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	10.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	17.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	24.	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	11.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	18.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	25.	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	12.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	19.	Ⓐ	Ⓑ	Ⓒ	Ⓓ										
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	13.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	20.	Ⓐ	Ⓑ	Ⓒ	Ⓓ										
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	14.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	21.	Ⓐ	Ⓑ	Ⓒ	Ⓓ										

CHAPTER

2

LINEAR EQUATIONS IN ONE VARIABLE

MATHEMATICAL REASONING

1. Solve for x :

$$\frac{(3x+1)}{16}+\frac{(2x-3)}{7}=\frac{(x+3)}{8}+\frac{(3x-1)}{14}$$

(A) 5 (B) 10 (C) –14 (D) 12

2. A number is 56 greater than the average of its third, quarter and one-twelfth. Find the number.

(A) 85 (B) 64 (C) 72 (D) 40

3. If $\frac{1}{3}$ of a number is 10 less than the original number, then the number is_____.

(A) 30 (B) 15 (C) 10 (D) 27

4. Solve for x: $6(3x + 2) – 5(6x – 1) = 6(x – 3) – 5(7x – 6) + 12x$

(A) – 1 (B) 1 (C) 0 (D) 2

5. The number 299 is divided into two parts in the ratio 5 : 8. The product of the numbers is _____.

(A) 21140 (B) 21294
(C) 21160 (D) 31294

6. If $\left(\frac{2}{3}\right)^{rd}$ of a number is 20 less than the original number, then the number is_____.

(A) 60 (B) 40 (C) 80 (D) 120

7. The perimeter of a rectangle is numerically equal to the area of rectangle. If width of rectangle is $2\frac{3}{4}$ cm, then its length is_____.

(A) $\frac{11}{3}$ cm (B) $\frac{22}{3}$ cm

(C) 11 cm (D) 10 cm

8. A number whose seventh part exceeds its eighth part by 1, is _____.

(A) 58 (B) 56 (C) 64 (D) 68

9. A number consists of two digits whose sum is 9. If 27 is subtracted from the original number, its digits are interchanged. Then the original number is _____.

(A) 53 (B) 45 (C) 92 (D) 63

10. The denominator of a rational number is greater than its numerator by 3. If 3 is subtracted from the numerator and 2 is added to its denominator, then the new number becomes 1/5. The original rational number is _____.

(A) $-\frac{5}{8}$ (B) $\frac{5}{8}$ (C) $\frac{3}{8}$ (D) $-\frac{3}{8}$

11. If $x-\left(2x-\frac{5x-1}{3}\right)=\frac{x-1}{3}+\frac{1}{2}$ then, x is equal to _____.

(A) $\frac{3}{2}$ (B) $\frac{4}{7}$ (C) $\frac{7}{3}$ (D) $\frac{9}{2}$

12. A two digit number is less than 20. The sum of the digits is double that of their product. What is the number?

(A) 12 (B) 15 (C) 13 (D) 11

13. Find two parts of 34 such that $\left(\frac{4}{7}\right)^{th}$ of one part is equal to $\left(\frac{2}{5}\right)^{th}$ of the other.

(A) 16, 18 (B) 14, 20
(C) 15, 19 (D) None of these

14. If the angles of a triangle are in the ratio 2 : 3 : 4, then the difference between the greatest and the smallest angle is _____.
(A) 10° (B) 20° (C) 30° (D) 40°

15. One-sixth of a number when subtracted from the number itself gives 25. The number is _____ .
(A) 30 (B) 32 (C) 35 (D) 28

EVERYDAY MATHEMATICS

16. There were only two candidates in an election. One got 62% votes and was elected by a margin of 144 votes. The total number of voters were _____.
(A) 500 (B) 600 (C) 700 (D) 800

17. Sunita is twice as old as Ashima. If six years is subtracted from Ashima's age and four years added to Sunita's age, then Sunita will be four times that of Ashima's age. Find the sum of their ages two years ago.
(A) 40 years (B) 42 years
(C) 36 years (D) 38 years

18. At a party, colas, squash and fruit juice were offered to guests. One-fourth of the guests drank colas, One-third drank squash, two-fifths drank fruit juice and just three did not drink anything. How many guests were there in all?
(A) 240 (B) 180 (C) 144 (D) 190

19. Two years ago, Mohit was three times as old as his son and two years hence, twice of Mohit's age will be equal to five times that of his son. Then the present age of Mohit is _____.
(A) 14 years (B) 38 years
(C) 32 years (D) 34 years

20. A steamer goes downstream and covers the distance between two ports in 5 hours while it covers the same distance upstream in 6 hours. If the speed of the stream is 1 km/hr, find the speed of the steamer in still water.
(A) 12 km/hr (B) 11 km/hr
(C) 13 km/hr (D) 14 km/hr

ACHIEVERS SECTION (HOTS)

21. Fill in the blanks.
(i) The solution of the equation $ax + b = 0$ is_____.
(ii) The shifting of a number from one side of an equation to other is _____.
(iii) If a and b are positive integers then the solution of the equation $ax = b$ has to be always _____.
(iv) Linear equation in one variable has only one variable with power _____.

	(i)	(ii)	(iii)	(iv)
(A)	$x = b/a$	commutativity	positive	1
(B)	$x = -b/a$	commutativity	negative	2
(C)	$x = b/a$	transposition	negative	2
(D)	$x = -b/a$	transposition	positive	1

22. Which of the following statements is CORRECT?

Statement - 1 : $x = \frac{1}{2}$ is the solution of $\frac{(2x-3)}{4} - \frac{(2x-1)}{2} = \frac{x-2}{3}$.

Statement - 2 : $x = \frac{63}{2}$ is the solution of $\frac{2x-17}{2} - \left(x - \frac{x-1}{3}\right) = 12$.

(A) Only Statement - 1
(B) Only Statement - 2
(C) Both Statement - 1 and Statement - 2
(D) Neither Statement - 1 nor Statement - 2

23. State 'T' for true and 'F' for false.

I. An altitude of a triangle is five-third the length of its corresponding base. If the altitude be increased by 4 cm and the base be decreased by 2 cm, the area of the triangle would remain the same. The base and the altitude of the triangle respectively is 12 cm and 20 cm.

II. The perimeter of a rectangle is 140 cm. If the length of the rectangle is increased by 2 cm and its breadth decreased by 2 cm, the area of the rectangle is increased by 66 sq. cm. The length and breadth of the rectangle respectively is 35 cm and 30 cm.

III. The sum of two numbers is 2490. If 6.5% of one number is equal to 8.5% of the other number, then one of the numbers will be 1411.

	I	II	III
(A)	F	F	F
(B)	F	T	T
(C)	T	F	F
(D)	T	F	T

24. Which of the following statements is INCORRECT?

(A) Kusum buys some chocolates at the rate of ₹ 10 per chocolate. She also buys an equal number of candies at the rate of ₹ 5 per candy. She makes a 20% profit on chocolates and 8% profit on candies. At the end of the day, all chocolates and candies are sold out and her profit is ₹ 240. Therefore, Kusum buys 100 chocolates.

(B) A carpenter charged ₹ 2500 for making a bed. The cost of materials used is ₹ 1100 and the labour charges are ₹ 200/hr. So, the carpenter will work for 7 hours.

(C) On dividing ₹ 200 between *A* and *B* such that twice of *A*'s share is less than 3 times *B*'s share by 200. So, *B*'s share is ₹120.

(D) Madhulika thought of a number, double it and added 20 to it. On dividing the resulting number by 25, she gets 4. Hence, the required number is 45.

25. Match the following.

Column-I	Column-II
P. If $\frac{5m}{6}+\frac{3m}{4}=\frac{19}{12}$, then m =	(i) $\frac{1}{6}$
Q. If $2x+\frac{3}{4}=\frac{x}{2}+1$, then x =	(ii) 36
R. If $\frac{z}{2}-\frac{3z}{4}+\frac{5z}{6}=21$, then z =	(iii) $\frac{27}{10}$
S. If $\frac{y}{2}-\frac{1}{5}=\frac{y}{3}+\frac{1}{4}$, then y =	(iv) 1

(A) P → (iii); Q → (iv); R → (i); S → (ii)
(B) P → (iv); Q → (ii); R → (iii); S → (i)
(C) P → (ii); Q → (i); R → (iii); S → (iv)
(D) P → (iv); Q → (i); R → (ii); S → (iii)

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1.	Ⓐ Ⓑ Ⓒ Ⓓ	8.	Ⓐ Ⓑ Ⓒ Ⓓ	15.	Ⓐ Ⓑ Ⓒ Ⓓ	22.	Ⓐ Ⓑ Ⓒ Ⓓ
2.	Ⓐ Ⓑ Ⓒ Ⓓ	9.	Ⓐ Ⓑ Ⓒ Ⓓ	16.	Ⓐ Ⓑ Ⓒ Ⓓ	23.	Ⓐ Ⓑ Ⓒ Ⓓ
3.	Ⓐ Ⓑ Ⓒ Ⓓ	10.	Ⓐ Ⓑ Ⓒ Ⓓ	17.	Ⓐ Ⓑ Ⓒ Ⓓ	24.	Ⓐ Ⓑ Ⓒ Ⓓ
4.	Ⓐ Ⓑ Ⓒ Ⓓ	11.	Ⓐ Ⓑ Ⓒ Ⓓ	18.	Ⓐ Ⓑ Ⓒ Ⓓ	25.	Ⓐ Ⓑ Ⓒ Ⓓ
5.	Ⓐ Ⓑ Ⓒ Ⓓ	12.	Ⓐ Ⓑ Ⓒ Ⓓ	19.	Ⓐ Ⓑ Ⓒ Ⓓ		
6.	Ⓐ Ⓑ Ⓒ Ⓓ	13.	Ⓐ Ⓑ Ⓒ Ⓓ	20.	Ⓐ Ⓑ Ⓒ Ⓓ		
7.	Ⓐ Ⓑ Ⓒ Ⓓ	14.	Ⓐ Ⓑ Ⓒ Ⓓ	21.	Ⓐ Ⓑ Ⓒ Ⓓ		

CHAPTER

3

UNDERSTANDING QUADRILATERALS

MATHEMATICAL REASONING

1. *ABCD* is a rhombus in which the altitude from *D* to side *AB* bisects *AB*. Then $\angle A$ and $\angle B$ respectively, are _____.

(A) 60°, 120° (B) 120°, 60°
(C) 80°, 100° (D) 100°, 80°

2. The exterior angle of a regular polygon is one-third of its interior angle. How many sides does the polygon has?

(A) 10 (B) 8 (C) 9 (D) 13

3. If the diagonals of a quadrilateral bisect each other at right angle, then it is a _____.

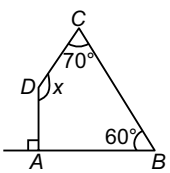
(A) Kite (B) Parallelogram
(C) Rhombus (D) Rectangle

4. The number of sides of a regular polygon whose each exterior angle has a measure of 30° is _____.

(A) 12 (B) 6 (C) 8 (D) 10

5. In the given figure, the value of *x* is_____.

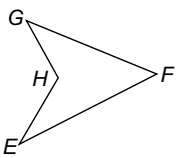
(A) 120°
(B) 140°
(C) 160°
(D) 130°



6. If each pair of opposite sides of a quadrilateral are equal and parallel, then it is a _____.

(A) Kite
(B) Trapezium
(C) Parallelogram
(D) None of these

7. The given quadrilateral *EFGH* is a _____.

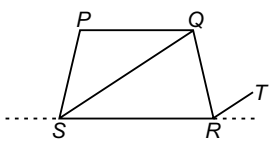


(A) Parallelogram
(B) Concave quadrilateral
(C) Convex quadrilateral
(D) Trapezium

8. The ratio of two sides of a parallelogram is 3 : 5 and its perimeter is 48 cm. Then, the sides of the parallelogram are _____.

(A) 9 cm, 16 cm (B) 9 cm, 15 cm
(C) 8 cm, 15 cm (D) 6 cm, 10 cm

9. In the given figure, line *RT* is drawn parallel to *SQ*. If $\angle QPS = 100°$, $\angle PQS = 40°$, $\angle PSR = 85°$ and $\angle QRS = 70°$, then $\angle QRT$ = _____.



(A) 45° (B) 65° (C) 85° (D) 90°

10. Which of the quadrilaterals is NOT a parallelogram?

(A) Rectangle (B) Square
(C) Kite (D) Rhombus

11. Which of the following statements is CORRECT ?

(A) The diagonals of a parallelogram are equal.
(B) The diagonals of a rectangle are perpendicular to each other.

(C) If the diagonals of a quadrilateral intersect at right angles, it is not necessarily a rhombus.

(D) Every quadrilateral is either a trapezium or a parallelogram or a kite.

12. Four angles of a quadrilateral are in the ratio 1 : 2 : 3 : 4. The difference between the greatest and the smallest angle is _____.

(A) 125° (B) 75°

(C) 108° (D) 120°

13. A trapezium in which non-parallel sides are equal is said to be _____.

(A) Right trapezium

(B) Equilateral trapezium

(C) Isosceles trapezium

(D) None of these

14. Which of the following can never be the measure of exterior angle of a regular polygon?

(A) 22° (B) 36°

(C) 45° (D) 30°

15. The quadrilateral having only one pair of opposite sides parallel is called a _____ .

(A) Square

(B) Rhombus

(C) Trapezium

(D) Parallelogram

EVERYDAY MATHEMATICS

16. The theatre in the town is built in the form of a kite. Its perimeter is 100 m. If one of its sides is 20 m, then what are the lengths of other sides?

(A) 20 m, 30 m, 30 m

(B) 30 m, 40 m, 40 m

(C) 20 m, 40 m, 32 m

(D) 30 m, 40 m, 50 m

17. Vikas's garden is in the form of a parallelogram whose one side is 4.8 cm and other side is $1\frac{1}{2}$ times of this side. He wants to fence his garden four times by a wire. Find the length of the wire required.

(A) 96 cm

(B) 108 cm

(C) 132 cm

(D) 84 cm

18. A field is in the form of an isosceles trapezium whose perimeter is 215 m. One of its non-parallel side is 50 m. What is the sum of its parallel sides?

(A) 115 m

(B) 60 m

(C) 165 m

(D) 135 m

19. Rohit has 6 wooden sticks of equal length. He wants to join all of them in such a way that they make a regular polygon. At what internal angle he has to join wooden stick with each other?

(A) 105°

(B) 120°

(C) 115°

(D) 90°

20. Atul is playing in a playground which is of the form of a parallelogram. He observes that the diagonals of the playground are 80 m and 60 m long. So, the playground is in the shape of _____.

(A) Rectangle

(B) Rhombus

(C) Kite

(D) Square

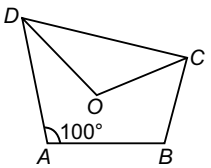
ACHIEVERS SECTION (HOTS)

21. Match the following :

	Column-I		Column-II
(P)	Diagonals of a rectangle	(1)	Bisect each other at right angles
(Q)	Diagonals of a square	(2)	Bisect each other
(R)	Diagonals of a rhombus	(3)	Equal and bisect each other
(S)	Diagonals of a parallelogram	(4)	Equal and bisect each other at right angles

(A) (P) → (1), (Q) → (2), (R) → (3), (S) → (4)
(B) (P) → (3), (Q) → (4), (R) → (1), (S) → (2)
(C) (P) → (4), (Q) → (2), (R) → (3), (S) → (1)
(D) (P) → (4), (Q) → (3), (R) → (2), (S) → (1)

22. In the given figure (not drawn to scale), *DO* and *CO* are the bisectors of ∠*ADC* and ∠*BCD* respectively. If ∠*ADC* = ∠*BCD* = 60° and ∠*DAB* = 100°, find the measure of ∠*DOC* and ∠*ABC* respectively.



(A) 100°, 160° (B) 110°, 150°
(C) 120°, 140° (D) 110°, 130°

23. Fill in the blanks.

(i) Sum of interior angles of a polygon of *n* sides is **P** right angles.

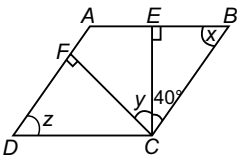
(ii) The measure of at least one **Q** angle of a concave quadrilateral is more than 180°.

(iii) A quadrilateral which has only one pair of equal opposite angles is **R** .

(iv) Sum of all exterior angles of a polygon of *n* sides is **S** .

	P	Q	R	S
(A)	4	exterior	kite	$n \times 360°$
(B)	$n - 2$	exterior	trapezium	$n \times 180°$
(C)	$2n - 4$	interior	trapezium	360°
(D)	2	interior	trapezium	180°

24. *ABCD* is a parallelogram. Find the angles *x*, *y* and *z* in the given figure.



(A) 40°, 50°, 60°
(B) 60°, 60°, 60°
(C) 50°, 50°, 50°
(D) 60°, 70°, 70°

25. Select the INCORRECT statement.

(A) Every rectangle is a trapezium.
(B) A quadrilateral can be drawn if all four sides and one angle is known.
(C) Triangle is a polygon whose sum of exterior angles is double the sum of interior angles.
(D) If diagonals of a quadrilateral are equal, it must be a rectangle.

☺☺☺

Darken your choice with HB Pencil

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	8.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	15.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	22.	Ⓐ	Ⓑ	Ⓒ	Ⓓ						
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	16.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	23.	Ⓐ	Ⓑ	Ⓒ	Ⓓ						
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	10.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	17.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	24.	Ⓐ	Ⓑ	Ⓒ	Ⓓ						
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	11.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	18.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	25.	Ⓐ	Ⓑ	Ⓒ	Ⓓ						
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	12.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	19.	Ⓐ	Ⓑ	Ⓒ	Ⓓ											
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	13.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	20.	Ⓐ	Ⓑ	Ⓒ	Ⓓ											
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	14.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	21.	Ⓐ	Ⓑ	Ⓒ	Ⓓ											

CHAPTER

4

PRACTICAL GEOMETRY

MATHEMATICAL REASONING

1. Given below are the steps of construction to construct a quadrilateral $ABCD$ where $AB = 5.6$ cm, $BC = 4.1$ cm, $CD = 4.4$ cm, $AD = 3.3$ cm and $\angle A = 75°$. Which of the following steps is INCORRECT?

Step 1 : Draw $AB = 5.6$ cm and construct $\angle BAX = 75°$.

Step 2 : With A as centre and radius = 3.3 cm, cut off $AD = 3.3$ cm along AX.

Step 3 : Join BD. With D as centre and radius = 4.1 cm, draw an arc.

Step 4 : With B as centre and radius = 4.1 cm, draw an arc to cut the arc drawn in above step at C. Join BC, CD to obtain the required quadrilateral $ABCD$.

(A) Step 1 only (B) Step 2 only
(C) Step 3 only (D) Step 4 only

2. It is possible to construct a quadrilateral with the sufficient data (other than five simple cases), where less than ___ parts but some other relations between them are given.

(A) Four (B) Five
(C) Three (D) Two

3. Arrange the steps of construction while constructing a parallelogram $ABCD$, given that $AB = 5$ cm, $BC = 4$ cm and $\angle B = 60°$.

1. With A as centre and radius equal to 4 cm, draw an arc cutting AY at D.
2. At A, draw $\angle YAB = 120°$. [$\because A + B = 180°$]
3. At B, draw $\angle XBA = 60°$.
4. Draw $AB = 5$ cm.
5. Join CD.
6. With B as centre and radius equal to 4 cm, drawn an arc cutting BX at C.

(A) 4, 3, 6, 2, 1, 5 (B) 4, 3, 2, 6, 5, 1
(C) 4, 6, 3, 1, 2, 5 (D) 4, 3, 6, 2, 5, 1

4. Arrange the steps of construction while constructing a quadrilateral $ABCD$ given $AB = 5.1$ cm, $AD = 4$ cm, $BC = 2.5$ cm, $\angle A = 60°$ and $\angle B = 85°$.

Step 1 : With B as centre and radius 2.5 cm, cut off $BC = 2.5$ cm along BY.

Step 2 : Construct $\angle XAB = 60°$ at A.

Step 3 : Join CD.

Step 4 : With A as centre and radius 4 cm, cut off $AD = 4$ cm along AX.

Step 5 : Draw $AB = 5.1$ cm.

Step 6 : Construct $\angle ABY = 85°$ at B.

(A) 5, 2, 4, 1, 3, 6
(B) 5, 4, 2, 1, 6, 3
(C) 5, 2, 4, 6, 1, 3
(D) 5, 2, 4, 1, 6, 3

5. If $AB \| DC$, $AB = 7$ cm, $BC = 6$ cm, $AD = 6.5$ cm and $\angle B = 70°$, then which figure can be constructed?

(A) Square (B) Trapezium
(C) Rhombus (D) Rectangle

6. Given below are the steps of construction of a quadrilateral $ABCD$, where $AB = 3.5$ cm, $BC = 6.5$ cm, $\angle A = 75°$, $\angle B = 105°$ and $\angle C = 120°$. Which of the following steps is INCORRECT?

Step 1 : Draw $AB = 3.5$ cm.

Step 2 : Draw $\angle XAB = 75°$ at A and $\angle ABY = 105°$ at B.

Step 3 : With B as centre and radius $BC = 6.5$ cm, draw an arc to intersect BY at C.

Step 4 : At C, draw $\angle ADC = 120°$ such that CZ meets AX at D.

(A) Step 1 only (B) Step 2 only
(C) Step 3 only (D) Step 4 only

7. To construct a kite, which of the following is necessary?

(A) Two adjacent unequal sides and included diagonal
(B) Two adjacent equal sides and included diagonal
(C) Length of opposite sides
(D) None of these

8. Which of the following statements is true about the construction of a quadrilateral where $AB = 3$ cm, $BC = 5$ cm, $AC = 9$ cm, $AD = 6$ cm, $CD = 2$ cm?

(A) It is possible to draw the quadrilateral.
(B) It is not possible to draw the quadrilateral, since $AD + DC < AC$.
(C) It is possible to draw the quadrilateral, since $AD + DC < AC$
(D) None of these

9. To construct a quadrilateral $ABCD$, which of the following parts is necessary ?

(A) Length of AB
(B) Length of BC
(C) Measure of $\angle A$, $\angle B$ and $\angle C$
(D) All of these

10. Which of the given properties of a parallelogram is necessary to construct it ?

(A) Opposite sides of a parallelogram
(B) Opposite angles of a parallelogram
(C) Diagonals of a parallelogram
(D) Both (A) and (B)

ACHIEVERS SECTION (HOTS)

11. Arrange the steps of construction while constructing a quadrilateral $ABCD$ given $AB = 5.3$ cm, $AD = 2.9$ cm, $\angle A = 70°$, $\angle B = 95°$ and $\angle C = 85°$.

Step 1 : With A as centre and radius 2.9 cm, draw an arc to cut AX at D.

Step 2 : At B, draw $\angle ZBA = 95°$ so that ZB intersects YD at C.

Step 3 : Draw $AB = 5.3$ cm.

Step 4 : At D draw $\angle ADY = 110°$

Step 5 : At A draw $\angle XAB = 70°$.

(A) 3, 4, 2, 1, 5 (B) 3, 5, 1, 4, 2
(C) 3, 1, 5, 4, 2 (D) 3, 5, 4, 2, 1

12. Match the following.

Column-I	Column-II
(P) Construction of a quadrilateral can be possible if at least	(1) two unequal sides and included diagonal are given.
(Q) Construction of quadrilateral must satisfy	(2) five independent elements are given
(R) A kite can be drawn if its	(3) 4 sides, 4 angles and 2 diagonals
(S) A quadrilateral has	(4) triangle inequality and angle sum property of a triangle

	P	Q	R	S
(A)	3	2	4	1
(B)	3	4	2	1
(C)	2	4	1	3
(D)	4	3	1	2

13. Arrange the steps (i) to (iv) in correct order, while constructing a parallelogram $ABCD$, given $\overline{AB} = 6$ cm, $\overline{AD} = 4$ cm, and diagonal $\overline{BD} = 3$ cm.

Step 1 : Draw $\overline{AB} = 6$ cm

Step (i) : Join $\overline{AD}$ and $\overline{BD}$.

Step (ii) : With A as centre, draw an arc of radius 4 cm.

Step (iii) : With B and D as centres and with 4 cm and 6 cm as radii, respectively, draw arcs to cut each other at C.

Step (iv) : With B as centre, draw an arc of radius 3 cm to cut the arc drawn in step (ii) at point D.

Step 6 : Join $\overline{CD}$ and $\overline{BC}$. $ABCD$ is the required parallelogram.

(A) (ii), (iv), (iii), (i)
(B) (iii), (ii), (v), (iv)
(C) (ii), (iv), (i), (iii)
(D) None of these

14. To construct a convex quadrilateral, which of the following cases is INCORRECT ?

(A) When the lengths of four sides and one diagonal are given.
(B) When the lengths of three sides and the two diagonals are given.
(C) When the lengths of four sides and one angle are given.
(D) When the lengths of two sides and two included angles are given.

15. Which of the following steps is INCORRECT while constructing a rhombus $ABCD$, given that AC = 8 cm and BD = 6 cm?

Step 1 : Draw AC = 8 cm.

Step 2 : Draw PQ, the perpendicular of AC. PQ intersects AC at point O.

Step 3 : With O as centre and radius equal to 3 cm, drawn an arc cutting OP at D.

Step 4 : With O as centre and radius equal to 3 cm, draw another arc cutting OQ at B.

Step 5 : Join AB, BC, CD and DA.

(A) Step 2 only
(B) Step 3 only
(C) Step 4 only
(D) Both Step 2 and Step 5

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Darken your choice with HB Pencil

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**5.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**9.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**13.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**6.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**10.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**14.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**7.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**11.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**15.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**8.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**12.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					

CHAPTER

5

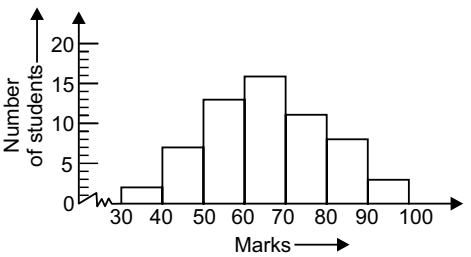
DATA HANDLING

MATHEMATICAL REASONING

1. A bag has 4 red balls and 2 yellow balls. (The balls are identical in all respect other than colour). A ball is drawn from the bag without looking into the bag. The probability of getting a red ball is ____.

(A) $\frac{1}{2}$ (B) $\frac{2}{3}$ (C) $\frac{1}{4}$ (D) $\frac{1}{5}$

DIRECTION (2 - 4) : The histogram representing the marks obtained by 60 students in a Mathematics examination.



2. What is the total number of students who obtained more than or equal to 80 marks in the examination?

(A) 13 (B) 3 (C) 8 (D) 11

3. If the minimum pass marks was 40, how many students failed ?

(A) 1 (B) 13 (C) 2 (D) 7

4. How many students were awarded merit, if the minimum marks required for it are 80?

(A) 10 (B) 11 (C) 12 (D) 8

5. A die is thrown. The probability of getting a multiple of 3 is ____.

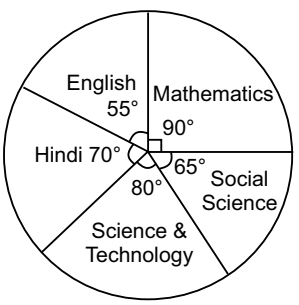
(A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{4}$ (D) $\frac{1}{5}$

6. From the given table, the number of students who got more than or equal to 50 marks, is ____.

Marks (class-interval)	No. of students
30 - 40	12
40 - 50	13
50 - 60	4
60 - 70	15
70 - 80	6

(A) 15 (B) 21 (C) 25 (D) 29

7. The given pie chart gives the marks scored in an examination by a student in English, Hindi, Science & Technology, Social Science and Mathematics. If the total marks obtained by the student were 540, then the subject in which the student scored 105 marks, is_____.



(A) English (B) Mathematics
(C) Social Science (D) Hindi

8. The probability of occurrence of an event is _____.

(A) $\frac{\text{Number of trials in which an event occured}}{\text{Total number of trials} - \text{Number of trials in which an event occured}}$

(B) $\frac{\text{Number of trials in which an event occured}}{\text{Total number of trials}}$

(C) $\frac{\text{Total number of trials}}{\text{Number of trials in which an event occured}}$

(D) $\frac{\text{Total number of trials} - \text{Number of trials in which an event occured}}{\text{Number of trials in which an event occured}}$

9. In a survey of 200 ladies, it was found that 82 like coffee while 118 dislike it. From these ladies, one is chosen at random. The probability that the chosen lady dislike coffee is _____.

(A) $\frac{59}{100}$ (B) $\frac{41}{100}$

(C) $\frac{100}{59}$ (D) $\frac{100}{41}$

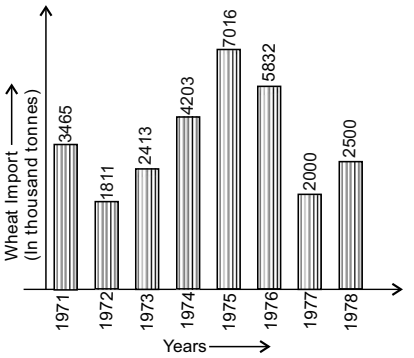
10. The number of times a particular entry occurs in a set of data is known as its

(A) Range (B) Class-size
(C) Frequency (D) Class-interval

11. The mid-value of a class-interval is called its

(A) Class-limit (B) Class-mark
(C) Class-width (D) Range

DIRECTION (12 - 15) : Study the graph carefully and answer the questions given below it.



12. In which year did the wheat import register highest increase over its preceding year ?

(A) 1973 (B) 1974
(C) 1975 (D) 1978

13. The wheat import in 1976 was approximately how many times to that of the year 1972 ?

(A) 0.31 (B) 1.68
(C) 2.41 (D) 3.22

14. The increase in wheat import in 1978 was what percent of the wheat import in 1977 ?

(A) 25 % (B) 5 %
(C) 125 % (D) 80 %

15. The wheat import in 1974 is approximately what percent of the average wheat import for the given years ?

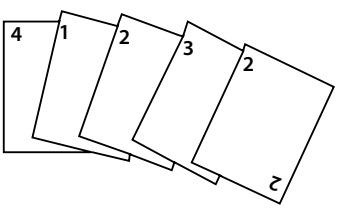
(A) 125 % (B) 115 %
(C) 190 % (D) 85 %

EVERYDAY MATHEMATICS

16 In a school only 3 out of 5 students can participate in a competition. What is the probability of the students who do not make it to the competition?

(A) 0.65 (B) 0.4
(C) 0.45 (D) 0.6

17. Rohan and Shalu are playing with 5 cards as shown in the figure. What is the probability of Rohan picking a card without seeing, that has the number 2 on it?



(A) $\frac{2}{5}$ (B) $\frac{1}{5}$ (C) $\frac{3}{5}$ (D) $\frac{4}{5}$

18. Monthly salary of a person is ₹ 15000. The central angle of the sector representing his expenses on food and house rent on a pie chart is 60°. The amount he spends on food and house rent is

(A) ₹ 5000 (B) ₹ 2500
(C) ₹ 6000 (D) ₹ 9000

19 A glass jar contains 6 red, 5 green, 4 blue and 5 yellow marbles of same size. Hari takes out a marble from the jar at random. What is the probability that the chosen marble is of red colour?

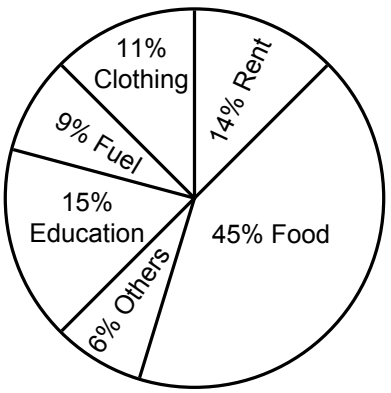
(A) $\frac{7}{10}$ (B) $\frac{3}{10}$ (C) $\frac{4}{5}$ (D) $\frac{2}{5}$

20. Ram put some buttons on the table. There were 4 blue, 7 red, 3 black and 6 white buttons in all. All of a sudden, a cat jumped on the table and knocked out one button on the floor. What is the probability that the button on the floor is blue?

(A) $\frac{7}{20}$ (B) $\frac{3}{5}$ (C) $\frac{1}{5}$ (D) $\frac{1}{4}$

ACHIEVERS SECTION (HOTS)

DIRECTION (21-22) : The given pie chart shows the spendings of a family on various heads during a month. Study the graph and answer the questions.



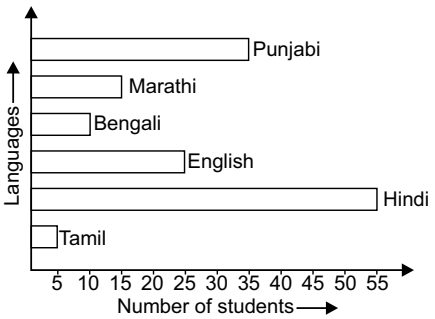
21. If the total income of the family is ₹ 25000, then the amount spent on rent and food together is _____.

(A) ₹ 17250 (B) ₹ 14750
(C) ₹ 11250 (D) ₹ 8500

22. What is the ratio of the expenses on education to the expenses on food?

(A) 1 : 3 (B) 3 : 1
(C) 3 : 5 (D) 5 : 3

23. The given bar graph shows the number of students in a hostel speaking different languages. Study the bar graph and answer the following questions.



(i) How many students are there in the hostel?

(ii) What is the ratio of the number of students speaking Punjabi to those speaking English?

(iii) What is the percentage of the students speaking Marathi over those speaking Hindi?

	(i)	(ii)	(iii)
(A)	152	3 : 4	27.9%
(B)	152	4 : 5	25%
(C)	145	7 : 5	27.2%
(D)	145	7 : 9	30%

24. Look at the given below data.

39, 25, 5, 33, 19, 21, 12, 48, 13, 21, 9, 1, 10, 8, 12, 17, 41,40, 12, 46, 37, 17, 27, 30, 6, 2, 23, 19

The frequency distribution of the data is given here.

P

Group	Tally Marks	Frequency
0-10	𝍸 I	6
10-20	𝍸 𝍸 I	11
20-30	IIII	4
30-40	𝍸	5
40-50	III	3

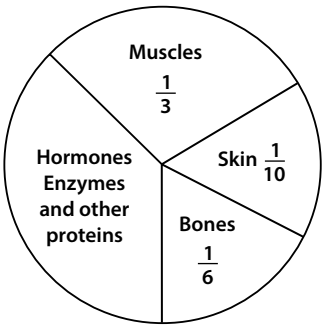
Q

Group	Tally Marks	Frequency
0-10	𝍸 I	6
10-20	𝍸 𝍸	10
20-30	𝍸	5
30-40	IIII	4
40-50	IIII	4

Which of the above tables is the frequency table of the given data?

(A) Only *P* (B) Only *Q*
(C) Neither *P* nor *Q*
(D) Can't be determined

25. The given pie chart represents the distribution of proteins in parts of a human body. What is the ratio of distribution of proteins in the muscles to that of proteins in the bones?



(A) 3 : 1 (B) 1 : 2
(C) 1 : 3 (D) 2 : 1

☺☺☺

Darken your choice with HB Pencil

1.	Ⓐ Ⓑ Ⓒ Ⓓ	8.	Ⓐ Ⓑ Ⓒ Ⓓ	15.	Ⓐ Ⓑ Ⓒ Ⓓ	22.	Ⓐ Ⓑ Ⓒ Ⓓ
2.	Ⓐ Ⓑ Ⓒ Ⓓ	9.	Ⓐ Ⓑ Ⓒ Ⓓ	16.	Ⓐ Ⓑ Ⓒ Ⓓ	23.	Ⓐ Ⓑ Ⓒ Ⓓ
3.	Ⓐ Ⓑ Ⓒ Ⓓ	10.	Ⓐ Ⓑ Ⓒ Ⓓ	17.	Ⓐ Ⓑ Ⓒ Ⓓ	24.	Ⓐ Ⓑ Ⓒ Ⓓ
4.	Ⓐ Ⓑ Ⓒ Ⓓ	11.	Ⓐ Ⓑ Ⓒ Ⓓ	18.	Ⓐ Ⓑ Ⓒ Ⓓ	25.	Ⓐ Ⓑ Ⓒ Ⓓ
5.	Ⓐ Ⓑ Ⓒ Ⓓ	12.	Ⓐ Ⓑ Ⓒ Ⓓ	19.	Ⓐ Ⓑ Ⓒ Ⓓ		
6.	Ⓐ Ⓑ Ⓒ Ⓓ	13.	Ⓐ Ⓑ Ⓒ Ⓓ	20.	Ⓐ Ⓑ Ⓒ Ⓓ		
7.	Ⓐ Ⓑ Ⓒ Ⓓ	14.	Ⓐ Ⓑ Ⓒ Ⓓ	21.	Ⓐ Ⓑ Ⓒ Ⓓ		

CHAPTER

6

SQUARES AND SQUARE ROOTS

MATHEMATICAL REASONING

1. If $\sqrt{2+\sqrt{x}} = 3$, then x = _____.

(A) 1 (B) $\sqrt{7}$

(C) 7 (D) 49

2. If $\frac{\sqrt{0.2304}+\sqrt{0.1764}}{\sqrt{0.2304}-\sqrt{0.1764}} = x$, then the value of x is ____.

(A) 0.8 (B) 15

(C) 12.5 (D) 0.16

3. Find the least number which must be subtracted from 7230 to make it a perfect square.

(A) 15 (B) 12

(C) 5 (D) 10

4. If $\sqrt{1+\frac{25}{144}} = 1+\frac{x}{12}$, then x is _____.

(A) 5 (B) 13

(C) 1 (D) 17

5. Square numbers can have _____ at the end.

(A) Odd number of zeroes

(B) Even number of zeroes

(C) Both (A) and (B)

(D) None of these

6. A number is multiplied by $2\frac{1}{3}$ times itself and then 61 is subtracted from the product obtained. If the final result is 9200, then the number is _____.

(A) 36 (B) 63

(C) 67 (D) 37

7. The product of two numbers is 1296. If one number is 16 times the other, find the numbers.

(A) 9, 144 (B) 8, 128

(C) 12, 192 (D) None of these

8. The least positive integer with which 661.25 should be multiplied so that the product is a perfect square, is _____.

(A) 4 (B) 5

(C) Both (A) and (B) (D) None of these

9. The square root of $\frac{36}{5}$ correct upto two decimal places is _____.

(A) 2.68 (B) 2.69

(C) 2.67 (D) 2.66

10. The value of $\sqrt{248+\sqrt{52+\sqrt{144}}}$ is _____.

(A) 14 (B) 12

(C) 16 (D) 13

11. If the three numbers are in the ratio 2 : 3 : 5, so that the sum of their squares is 608. Find the numbers respectively.

(A) 8, 12, 20 (B) 12, 8, 20

(C) 20, 8, 12 (D) 20, 12, 8

12. Square root of $\frac{0.081}{0.0064} \times \frac{0.484}{6.25} \times \frac{2.5}{12.1}$ is _____.

(A) 0.45 (B) 0.75

(C) 0.95 (D) 0.99

13. The greatest 6-digit number, which is a perfect square is _____.

(A) 998001 (B) 995001
(C) 997001 (D) 996001

14. Find the value of

$$\left(\sqrt{\frac{625}{9801}}+\sqrt{\frac{576}{1089}}\right)\times\left(\sqrt{\frac{121}{\sqrt{21025}+144}}\right)$$

(A) $\frac{97}{153}$ (B) $\frac{89}{51}$
(C) $\frac{101}{99}$ (D) $\frac{69}{33}$

15. Find the square root of the following correct upto two decimal places.

(i) $4\frac{5}{7}$ (ii) $9\frac{9}{13}$

	(i)	(ii)
(A)	2.52	3.18
(B)	2.28	2.98
(C)	2.17	3.11
(D)	2.17	2.98

EVERYDAY MATHEMATICS

16. The area of a square field is $80\frac{244}{729}$ sq. m. The length of each side of the field, is _____.

(A) 8.96 m (B) 10.26 m
(C) 13.54 m (D) 12.26 m

17. A certain number of men went to a hotel. Each man spent as many rupees as one-fourth of the men. If the total bill paid was ₹ 20449, then how many men visited the hotel?

(A) 286 (B) 284
(C) 281 (D) 283

18. A general arranges his soldiers in rows to form a perfect square. He finds that in doing so, 60 soldiers are left out. If the total number of soldiers be 8160, find the number of soldiers in each row.

(A) 81 (B) 90
(C) 80 (D) 91

19. A group of students decided to collect as many paise from each member of the group as is the number of members. If the total collection amounts to ₹ 59.29, the number of members in the group is _____.

(A) 57 (B) 67
(C) 77 (D) 87

20. A housing society has been allotted a square piece of land measuring 2550.25 sq. m. What is the side of the plot?

(A) 50.25 m (B) 50.5 m
(C) 50.65 m (D) 50.05 m

ACHIEVERS SECTION (HOTS)

21. Find the value of

$$\sqrt{10+\sqrt{25+\sqrt{108+\sqrt{154+\sqrt{225}}}}}+\left(\sqrt{\frac{225}{729}}-\sqrt{\frac{25}{144}}\right)\div\sqrt{\frac{16}{81}}$$

(A) $\frac{69}{16}$ (B) $\frac{54}{7}$
(C) $\frac{31}{3}$ (D) $\frac{108}{13}$

22. Find the value of P, Q, R and S.

(i) Square root of 1354.24 is **P**.
(ii) Square root of 151.29 is **Q**.
(iii) Square root of 7208.01 is **R**.
(iv) Square root of 1789.29 is **S**.

	P	Q	R	S
(A)	38.2	12.9	83.4	41.3
(B)	36.8	11.3	86.9	41.7
(C)	35.4	13.3	85.1	42.9
(D)	36.8	12.3	84.9	42.3

23. Which of the following options is TRUE ?

(A) Square of any odd number can be expressed as the sum of two consecutive positive integers.

(B) Square of any natural number can be expressed as the sum of successive odd numbers starting from 1.

(C) For any natural number $m > 1$, $2m$, $m^2 - 1$ and $m^2 + 1$ form pythagorean triplets.

(D) All of these

24. Study the statements and choose the correct option.

Statement-1 : The square root of certain decimals are obtained by first changing the decimals into fractions with perfect squares as their numerators and denominators.

Statement-2 : $(26.1)^2$ lies between 400 and 900.

(A) Both Statement-1 and Statement-2 are true.

(B) Statement-1 is true but Statement-2 is false.

(C) Statement-1 is false but Statement-2 is true.

(D) Both Statement-1 and Statement-2 are false.

25. State 'T' for true and 'F' for false.

(i) The square root of 0.9 is 0.3.

(ii) The square root of a perfect square of n digits will have $\left(\frac{n+1}{2}\right)$ digits, if n is odd.

(iii) All numbers of a pythagorean triplet are odd.

(iv) There are 200 natural numbers between 100^2 and 101^2.

	(i)	(ii)	(iii)	(iv)
(A)	T	F	T	F
(B)	F	T	F	T
(C)	T	T	F	F
(D)	F	T	T	F

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Darken your choice with HB Pencil

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**8.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**15.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**22.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**9.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**16.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**23.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**10.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**17.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**24.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**11.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**18.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**25.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**12.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**19.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**13.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**20.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**14.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**21.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					

CHAPTER

7

CUBES AND CUBE ROOTS

MATHEMATICAL REASONING

1. The value of $45^3 - 65^3 - 20^3$ is _____.

(A) 175500 (B) – 191500
(C) 170000 (D) – 170000

2. If $\sqrt[3]{-2744} \div \sqrt[3]{0.008} = x$, then the value of x is _____.

(A) 70 (B) – 70
(C) 14 (D) – 14

3. If $\sqrt[3]{3\left(\sqrt[3]{x} - \frac{1}{\sqrt[3]{x}}\right)} = 2$, then $\sqrt[3]{x} + \frac{1}{\sqrt[3]{x}} =$ ___.

(A) $\frac{10}{3}$ (B) $-\frac{10}{3}$
(C) $\frac{3}{15}$ (D) Both (A) and (B)

4. How many cubes of side 2 cm can be packed in a cubical box with inner side equal to 4 cm?

(A) 6 (B) 4
(C) 8 (D) 2

5. Find the smallest natural number by which 1458 must be divided so that the quotient is a perfect cube.

(A) 4 (B) 2
(C) 6 (D) 8

6. In the five digit number 1*b*6*a*3, *a* is the greatest single digit perfect cube and twice of it exceeds *b* by 7. Then the sum of the number and its cube root is _____.

(A) 18700 (B) 11862
(C) 19710 (D) 25320

7. The value of $\sqrt[3]{\frac{-a^6 \times b^3 \times c^{21}}{c^9 \times a^{12}}}$ is _____.

(A) $\frac{-bc^3}{a^2}$ (B) $\frac{bc^4}{a^2}$
(C) $\frac{-ab^4}{c^2}$ (D) $\frac{-bc^4}{a^2}$

8. Three numbers are in the ratio 2 : 3 : 5 to one another. The sum of their cubes is 54880. The numbers are_____.

(A) 14, 21, 35 (B) 12, 15, 17
(C) 14, 18, 21 (D) 21, 28, 32

9. The cube of a 2-digit number will contain _____.

(A) 4 digits (B) 5 digits
(C) 6 digits (D) 4, 5 or 6 digits

10. The cube of an odd natural number is always _____.

(A) Even (B) Odd
(C) Even or odd (D) Can't say

11. The length of each side of a cubical box is 2.4 m. Its volume is _____.

(A) 1.3824×10^7 cu. cm
(B) 13.824 cu. cm
(C) 1.3824×10^6 cu. cm
(D) 13.824×10^4 cu. cm

12. The unit's digit of the cube of a number is 9. The unit's digit of its cube root is _____.

(A) 9 (B) 7
(C) 3 (D) 1

13. The cube of a number x is nine times of x, then find x, where $x \neq 0$ and $x \neq -3$.

(A) 8 (B) 2
(C) 4 (D) 3

14. Two cubes have volumes in the ratio 1 : 27. The ratio of the area of the face of one to that of the other is ____.

(A) 1 : 3 (B) 1 : 6
(C) 1 : 9 (D) 1 : 18

15. The smallest number by which 392 must be multiplied so that the product is a perfect cube, is ____.

(A) 3 (B) 5
(C) 7 (D) 9

EVERYDAY MATHEMATICS

16. Mohit gave a problem to Samrath.

> Difference of two perfect cubes is 189. If the cube root of the smaller of the two numbers is 3, find the cube root of the larger number.

Help Samrath to answer the question.

(A) 4 (B) 6
(C) 8 (D) 10

17. A tank is in the form of a cube whose volume is 9261000 m^3. Find the length of side of the tank.

(A) 230 m (B) 250 m
(C) 210 m (D) 180 m

18. Atul made a cuboid of plasticine. Length, breadth and height of the cuboid are 25 cm, 25 cm and 50 cm. How many minimum such cuboids he needs to make a perfect cube?

(A) 4 (B) 20
(C) 12 (D) 25

19. A rectangular cubical piece of metal of dimensions 2 cm × 3 cm × 4 cm is melted. Some more of the metal is added and it is made into a cube. The cube has integral measures for its sides. What is the minimum amount of metal that is added and what is the side of this cube?

(A) 10 cm^3, 4 cm (B) 3 cm^3, 3 cm
(C) 11 cm^3, 3 cm (D) 4 cm^3, 3 cm

20. To collect rain water, Mini made a cubical tank which can hold 91125 m^3 water. She uses this water for watering the plants of her garden. What is the height of the tank?

(A) 50 m (B) 25 m
(C) 45 m (D) 40 m

ACHIEVERS SECTION (HOTS)

21. Which of the following options is INCORRECT?

(A) Three numbers are in the ratio 1 : 2 : 3 and the sum of their cubes is 4500. The numbers will be 5, 10, 15.
(B) The digit in the units place for the cube of a four digit number of the form $xyz8$ is 2.
(C) The smallest number by which 3600 be divided to make it a perfect cube is 450.
(D) None of these

22. Find the cube root of:

(i) 0.003375 = **P**.
(ii) 1.331 = **Q**.
(iii) 4.913 = **R**.
(iv) 15.625 = **S**.

	P	Q	R	S
(A)	0.215	1.31	2.7	2.55
(B)	0.115	1.11	1.17	3.25
(C)	0.15	1.1	1.7	2.5
(D)	0.25	1.21	2.17	4.15

23. Match the following.

	Column-I	Column-II
P.	The smallest number that should be subtracted from 130 to make it perfect cube is	(i) 4
Q.	The smallest number that should be subtracted from 9268 to make it perfect cube is	(ii) 3
R.	The smallest number that should be added to 2194 to make it perfect cube is	(iii) 5
S.	The smallest number that should be added to 6855 to make it perfect cube is	(iv) 7

(A) P → (iii); Q → (i); R → (iv); S → (ii)
(B) P → (ii); Q → (iv); R → (i); S → (iii)
(C) P → (iii); Q → (i); R → (ii); S → (iv)
(D) P → (iii); Q → (iv); R → (ii); S → (i)

24. Evaluate the following.

(i) $\sqrt[3]{\frac{0.027}{0.008}} \div \sqrt[3]{\frac{0.729}{0.512}} - \frac{1}{3}$

(ii) $\sqrt[3]{343} + \sqrt[3]{0.064} - \sqrt[3]{0.125}$

(iii) $\left[\left(\sqrt[3]{\frac{-216}{42875}} + \sqrt[3]{\frac{64}{125}}\right)\right] \times \sqrt[3]{\frac{343}{1331}}$

	(i)	(ii)	(iii)
(A)	1	6.9	$\frac{2}{5}$
(B)	3	7.1	$\frac{1}{5}$
(C)	4	7.9	$\frac{2}{5}$
(D)	1	6.5	$\frac{1}{5}$

25. Which of the following statements is CORRECT ?

Statement - 1 : Cube root of 117.649 is a rational number.

Statement - 2 : Cube of an odd number may or may not be odd.

(A) Only Statement - 1
(B) Only Statement - 2
(C) Both Statement - 1 and Statement - 2
(D) Neither Statement - 1 nor Statement - 2

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Darken your choice with HB Pencil

1.	Ⓐ Ⓑ Ⓒ Ⓓ	**8.**	Ⓐ Ⓑ Ⓒ Ⓓ	**15.**	Ⓐ Ⓑ Ⓒ Ⓓ	**22.**	Ⓐ Ⓑ Ⓒ Ⓓ
2.	Ⓐ Ⓑ Ⓒ Ⓓ	**9.**	Ⓐ Ⓑ Ⓒ Ⓓ	**16.**	Ⓐ Ⓑ Ⓒ Ⓓ	**23.**	Ⓐ Ⓑ Ⓒ Ⓓ
3.	Ⓐ Ⓑ Ⓒ Ⓓ	**10.**	Ⓐ Ⓑ Ⓒ Ⓓ	**17.**	Ⓐ Ⓑ Ⓒ Ⓓ	**24.**	Ⓐ Ⓑ Ⓒ Ⓓ
4.	Ⓐ Ⓑ Ⓒ Ⓓ	**11.**	Ⓐ Ⓑ Ⓒ Ⓓ	**18.**	Ⓐ Ⓑ Ⓒ Ⓓ	**25.**	Ⓐ Ⓑ Ⓒ Ⓓ
5.	Ⓐ Ⓑ Ⓒ Ⓓ	**12.**	Ⓐ Ⓑ Ⓒ Ⓓ	**19.**	Ⓐ Ⓑ Ⓒ Ⓓ		
6.	Ⓐ Ⓑ Ⓒ Ⓓ	**13.**	Ⓐ Ⓑ Ⓒ Ⓓ	**20.**	Ⓐ Ⓑ Ⓒ Ⓓ		
7.	Ⓐ Ⓑ Ⓒ Ⓓ	**14.**	Ⓐ Ⓑ Ⓒ Ⓓ	**21.**	Ⓐ Ⓑ Ⓒ Ⓓ		

CHAPTER

8

COMPARING QUANTITIES

MATHEMATICAL REASONING

1. When the price of a product was decreased by 10%, the number of products sold increased by 30%. What was the increase on the total revenue?

(A) 23% (B) $16\frac{2}{3}\%$

(C) 15% (D) 17%

2. If a number x is 10% less than the another number y and y is 10% more than 125, then x is equal to ____.

(A) 123.75 (B) 140.55
(C) 143 (D) 150

3. If 23% of a is 46, then find a.

(A) 150 (B) 200
(C) 20 (D) 300

4. A number is increased by 10% and then it is decreased by 10%. Find the net increase or decrease percent.

(A) Decrease by 1%
(B) Decrease by 10%
(C) Increase by 2%
(D) Increase by 11%

5. If S.P. of an article is $\frac{4}{3}$ of its C.P., then the profit % in the transaction is ____.

(A) $\frac{1}{3}\%$ (B) $20\frac{1}{2}\%$

(C) $33\frac{1}{3}\%$ (D) $25\frac{1}{2}\%$

6. If 30% of 140 = x% of 840, then the value of x is ____.

(A) 5 (B) 15 (C) 24 (D) 60

7. x is 5% of y, y is 24% of z. If x = 480, find the values of y and z respectively.

(A) 9500, 40000 (B) 9600, 40000
(C) 9800, 50000 (D) 9600, 50000

8. If 12.5% of 192 = 50% of x, then x =

(A) 45 (B) 25 (C) 48 (D) 92

9. The simple interest at x % for x years will be ₹ x on a sum of ____.

(A) ₹ x (B) ₹ 100 x

(C) $₹\left(\frac{100}{x}\right)$ (D) $₹\left(\frac{100}{x^2}\right)$

10. Simple interest on a certain amount is $\frac{9}{16}$ of the principal. If the numbers representing the rate of interest (in percent) and time (in years) be equal, then time for which the principal is lent out, is _____.

(A) $5\frac{1}{2}$ years (B) $6\frac{1}{2}$ years

(C) 7 years (D) $7\frac{1}{2}$ years

11. A watch worth ₹ 5400 is offered for sale at ₹ 4500. What percent discount is offered during the sale?

(A) 50/3 (B) 49/3 (C) 25/3 (D) 34/3

12. The population of a town was decreasing every year due to migration, poverty and unemployment. The present population of the town is 6,31,680. Last year the migration was 4% and the year before last, it was 6%. What was the population two years ago?

(A) 9,00,000 (B) 5,00,000
(C) 6,00,000 (D) 7,00,000

13. Monika purchased a pressure cooker at $\left(\frac{9}{10}\right)^{th}$ of its selling price and sold it at 8% more than its S.P. Find her gain percent.
(A) 20% (B) 10% (C) 30% (D) 40%

14. Sam invested ₹ 15000 at 10% per annum for one year. If the interest is compounded half-yearly, then the amount received by Sam at the end of the year will be
(A) ₹ 16500 (B) ₹ 16525.50
(C) ₹ 16537.50 (D) ₹ 18150

15. A real estate agent receives ₹ 50,000 as commission, which is 4% of the selling price. At what price does the agent sell the property?
(A) ₹ 1250000 (B) ₹ 1025000
(C) ₹ 1125000 (D) ₹ 1450000

EVERYDAY MATHEMATICS

16. Abha purchased a house from Avas Parishad on credit. If the cost of the house is ₹ 64000 and the rate of interest is 5% per annum compounded half-yearly, find the interest paid by Abha after one and a half year.
(A) ₹ 4900 (B) ₹ 4921
(C) ₹ 4810 (D) ₹ 4700

17. A grocer purchased 80 kg of sugar at ₹ 13.50 per kg and mixed it with 120 kg of sugar of cost ₹16 per kg. At what rate should he sell the mixture (per kg) to gain 16%?
(A) ₹ 15.30 (B) ₹ 19.18
(C) ₹ 17.40 (D) ₹ 18.66

18. A milkman sold two of his buffaloes for ₹ 20000 each. On one he made a gain of 5% and on the other a loss of 10%. Find his overall gain or loss.
(A) Loss of ₹ 1269.84
(B) Gain of ₹ 4268.84
(C) Gain of ₹ 1269.84
(D) Loss of ₹ 1200

19. A book was sold for ₹ 27.50 with a profit of 10%. If it were sold for ₹ 25.75, then what would have been the percentage of profit or loss?
(A) Loss, 3% (B) Profit, 2%
(C) Profit, 3% (D) Loss, 2%

20. The cost of a vehicle is ₹ 175000. If its value depreciates at the rate of 20% per annum, then the total depreciation after 3 years was ____.
(A) ₹ 86400 (B) ₹ 82500
(C) ₹ 84500 (D) ₹ 85400

ACHIEVERS SECTION (HOTS)

21. Select the INCORRECT match.

	Principal (in ₹)	Rate% (p.a.)	Time (in years)	C.I. (in ₹)
(A)	1000	5%	3	157.63
(B)	360	20%	2	158.40
(C)	3000	10%	3	939
(D)	72000	6%	3	13753.15

22. Pankaj borrowed ₹ 8000 for 2 years at 15% per annum. Calculate the amount, if interest is
(i) compounded annually
(ii) compounded half yearly

	(i)	(ii)
(A)	₹ 10550	₹ 11883.25
(B)	₹ 10090	₹ 12432.75
(C)	₹ 10580	₹ 10502.50
(D)	₹ 10580	₹ 10683.75

23. The difference between the compound interest and simple interest on a certain sum of money at 10% per annum for 2 years is ₹ 500. Find the sum when the interest is compounded annually.

(A) ₹ 50000 (B) ₹ 55000
(C) ₹ 40000 (D) ₹ 65000

24. State 'T' for true and 'F' for false.

(i) A shopkeeper bought a cycle for ₹ 1200 and sold it for ₹ 1500, then his gain percentage is 25%.

(ii) 200 kg of sugar was purchased at the rate of ₹ 15 per kg and sold at a profit of 5%. Then selling price of sugar is ₹ 16 per kg.

(iii) A person sells an article for ₹ 550 and gain $\left(\frac{1}{10}\right)^{th}$ of the cost price. Then the gain percent is 11%.

(iv) The cost price of a dinning table is ₹ 1500 and its marked price is ₹ 1800. If a shopkeeper sells it at a loss of 8%, then the discount offered by him is $23\frac{1}{3}\%$.

	(i)	(ii)	(iii)	(iv)
(A)	T	T	F	T
(B)	F	F	T	F
(C)	T	F	F	T
(D)	F	F	T	T

25. Match the following.

Column-I		Column-II
(i) Gun powder contains 75% nitre and 10% sulphur. The rest of it is charcoal. The amount of charcoal in 9 kg of gun powder (in kg) is	(a)	1.5
(ii) A cycle merchant allows 25% discount on the marked price of the cycles and still makes a profit of 20%. If he gains ₹ 360 over the sale of one cycle, the marked price of the cycle (in ₹) is	(b)	1.35
(iii) Time (in years) in which ₹ 64000 will amount to ₹ 68921 at 5% p.a., interest being compounded semi-annually is	(c)	2880

(A) (i)→(c), (ii)→(b), (iii)→(a)
(B) (i)→(b), (ii)→(a), (iii)→(c)
(C) (i)→(b), (ii)→(c), (iii)→(a)
(D) (i)→(c), (ii)→(a), (iii)→(b)

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Darken your choice with HB Pencil

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**8.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**15.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**22.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**9.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**16.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**23.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**10.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**17.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**24.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**11.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**18.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**25.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**12.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**19.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**13.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**20.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**14.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**21.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					

CHAPTER

9

ALGEBRAIC EXPRESSIONS AND IDENTITIES

MATHEMATICAL REASONING

1. Multiply $6x^3 - y + 3x^2y$ by $x^2 + y^2$.

(A) $6x^5 - 3x^4y - 6x^3y^2 + 2x^2y^3 - y^4$

(B) $6x^5 + 3x^4y + 6x^3y^2 - x^2y + 3x^2y^3 - y^3$

(C) $6x^5 - 3x^4y + 6x^3y^2 + 2x^2y^3 - y^5$

(D) $6x^5 + 3x^4y - 6x^3y^2 + 2x^2y^3 - y^5$

2. If $3x + 4y = 18$ and $xy = 6$, find the value of $9x^2 + 16y^2$.

(A) 180 (B) 144

(C) 324 (D) 170

3. Simplify :

$$\left[2x^2 - \frac{1}{400}y^2\right]^2 - \left[2x^2 + \frac{1}{400}y^2\right]^2$$

(A) $-\frac{x^2y^2}{40}$ (B) $-\frac{x^2y^2}{50}$

(C) $\frac{xy}{50}$ (D) $-\frac{x^2y^2}{5}$

4. Square of $9x - 7xy$ is

(A) $81x^2 + 49x^2y^2$

(B) $81x^2 - 49x^2y^2$

(C) $81x^2 + 49x^2y^2 - 126x^2y$

(D) $81x^2 + 49x^2y^2 - 63x^2y$

5. If $x^2 + \frac{1}{x^2} = 53$, find the value of $x - \frac{1}{x}$.

(A) $\sqrt{51}$ (B) $\sqrt{53}$

(C) $\sqrt{61}$ (D) $\sqrt{63}$

6. If $3x - 7y = 10$ and $xy = -1$, then the value of $9x^2 + 49y^2$ is _____.

(A) 58 (B) 142

(C) 104 (D) – 104

7. The product of $(x^2 + 3x + 5)$ and $(x^2 - 1)$ is _____.

(A) $x^4 + 3x^3 - 4x^2 - 3x - 5$

(B) $x^4 + 3x^3 + 4x^2 - 3x - 5$

(C) $x^4 + 3x^3 + 4x^2 + 3x - 5$

(D) $x^4 + x^3 + x + 5$

8. Find the missing term in the following problem.

$$\left(\frac{3x}{4} - \frac{4y}{3}\right)^2 = \frac{9x^2}{16} + \frac{16y^2}{9} + \underline{\quad ? \quad}$$

(A) $2xy$ (B) $-2xy$

(C) $12xy$ (D) $-12xy$

9. What should be added to $4p^2 + 5p + 7$ to get $7p^2 + 2p + 9$?

(A) $3p^2 - 3p + 2$ (B) $3p^2 + 3p + 2$

(C) $-3p^2 + 3p - 2$ (D) $3p^2 - 3p - 2$

10. Simplify :

$$\frac{3}{2}x^2(x^2-1) + \frac{1}{4}x^2(x^2+x) - \frac{3}{4}x(x^3-1)$$

(A) $x^4 + \frac{1}{2}x^3 + \frac{1}{4}x^2 + x$

(B) $2x^4 + \frac{1}{4}x^3 - \frac{3}{4}x^2 + \frac{1}{4}x$

(C) $x^4 + \frac{1}{4}x^3 - \frac{3}{2}x^2 + \frac{3}{4}x$

(D) $2x^4 + \frac{3}{4}x^3 - \frac{1}{4}x^2 + \frac{3}{4}x$

11. What must be subtracted from $x^4 + 2x^2 - 3x + 7$ to get $x^3 + x^2 + x - 1$?

(A) $x^4 - x^3 + x^2 - 4x + 8$
(B) $x^3 + x^2 - 4x + 8$
(C) $x^4 - x^3 + x^2 + 4x - 8$
(D) $x^4 - x^3 - x^2 + 4x - 8$

12. If $x + \frac{1}{x} = 5$, find the value of $x^4 + \frac{1}{x^4}$.
(A) 144 (B) 400
(C) 236 (D) 527

13. Multiply : $\left(4x + \frac{3y}{5}\right)$ and $\left(3x - \frac{4y}{5}\right)$
(A) $12x^2 + \frac{7xy}{5} - \frac{12y^2}{25}$
(B) $12x^2 + \frac{7xy}{5} + \frac{12y^2}{5}$
(C) $12x^2 - \frac{7xy}{5} - \frac{12y^2}{25}$
(D) None of these

14. Add : $5x^2 - \frac{1}{3}x + \frac{5}{2}, -\frac{1}{2}x^2 + \frac{1}{2}x - \frac{1}{3}$ and $-2x^2 + \frac{1}{5}x - \frac{1}{6}$.
(A) $\frac{5}{2}x^2 + \frac{11}{30}x + 2$
(B) $\frac{3}{2}x^2 + \frac{30}{11}x + 3$
(C) $\frac{5}{2}x^2 + \frac{13}{30}x + 1$
(D) $\frac{3}{4}x^2 + \frac{12}{11}x + 5$

15. Find the value of a if $pqa = (3p + q)^2 - (3p - q)^2$.
(A) 11 (B) 21
(C) 10 (D) 12

EVERYDAY MATHEMATICS

16. The perimeter of a triangular field is $6p^2 - 4p + 9$ and two of its sides are $p^2 - 2p + 1$ and $3p^2 - 5p + 3$. Find the third side of the field.
(A) $8p^2 + 11p - 7$
(B) $2p^2 + 3p + 5$
(C) $3p^2 + 5p - 4$
(D) $5p^2 - 5p + 9$

17. If $(x - 5)$ notebooks cost ₹ $(x^2 - 13x + 40)$, what is the cost of one notebook?
(A) $(x - 1)$ (B) $(x - 2)$
(C) $(x - 6)$ (D) $(x - 8)$

18. Ameesha and Prachi love gardening. They water their garden regularly. The length and breadth of Ameesha's kitchen garden are x m and y m respectively. The length of Prachi's kitchen garden is 5 m more than that of Ameesha's garden and the breadth of Prachi's garden is 3 m more than that of Ameesha's garden. Find the difference between the area of Ameesha's kitchen garden and Prachi's kitchen garden.
(A) $(5x + 8y + 10)m^2$
(B) $(3x + 5y - 15)m^2$
(C) $(3x + 5y + 15)m^2$
(D) $(xy + 3x + 5y + 15)m^2$

19. Amit want to buy a rectangular field whose area is $(3a^2 + 5ab + 2b^2)$ sq. units. One of its sides is $(a + b)$ units. Find the length of the fence around the field.
(A) $(10a + 20b)$ units
(B) $(4a + 3b)$ units
(C) $(2a + 2b)$ units
(D) $(8a + 6b)$ units

20. A T-shirt costs ₹$(x^2 - xy - y^2)$ and a sweater costs ₹$(2x^2 + 8xy - 2y^2)$ and a jeans cost ₹$(x^2 - 3xy + 4y^2)$. After buying these items Mohit paid ₹$(2x + y)^2$ to the cashier. How much amount Mohit receive from the cashier?
(A) ₹ 0 (B) ₹ $2x$
(C) ₹ $(x + y)$ (D) ₹ $2y$

ACHIEVERS SECTION (HOTS)

21. Which of the following options hold?

Statement-I : The value of the product $(4a^2 + 3b)(4a^2 + 3b)$ at $a = 1$ and $b = 2$ is 100.

Statement-II : Value of

$$\frac{(997 + 496)^2 - (997 - 496)^2}{997 \times 496}$$ is 2.

(A) Both Statement-I and Statement-II are true.
(B) Statement-I is true but Statement-II is false.
(C) Statement-I is false but Statement-II is true.
(D) Both Statement-I and Statement-II are false.

22. Match the following.

	Column-I	Column-II
P.	$(3x^2 - 4xy) \times (3x^2 - 3xy)$	(i) $12x^2 + 53xy + 55y^2$
Q.	$(x^2 + 4y) \times (9x^2 + 9y)$	(ii) $9x^2 + 2y^4 + 11xy^2$
R.	$(3x + 5y) \times (4x + 11y)$	(iii) $9x^4 - 21x^3y + 12x^2y^2$
S.	$(y^2 + x) \times (2y^2 + 9x)$	(iv) $9x^4 + 45x^2y + 36y^2$

(A) P → (iii); Q → (iv); R → (i); S → (ii)
(B) P → (ii); Q → (i); R → (iv); S → (iii)
(C) P → (iv); Q → (iii); R → (i); S → (ii)
(D) P → (iii); Q → (ii); R → (iv); S → (i)

23. If $x^2 + y^2 = 29$ and $xy = 2$, find the value of (i) $x + y$ (ii) $x - y$ (iii) $x^4 + y^4$

	(i)	(ii)	(iii)
(A)	$\pm\sqrt{35}$	± 6	849
(B)	$\pm\sqrt{23}$	± 5	833
(C)	$\pm\sqrt{33}$	± 5	833
(D)	$\pm\sqrt{29}$	± 3	849

24. Fill in the blanks.
(i) The product of two monomials is always **P**.
(ii) An equation is true for **Q** values of the variable.
(iii) An identify is true for **R** values of the variable.
(iv) The numerical factor of a term is called **S**.

	P	Q	R	S
(A)	Binomial	all	certain	variable
(B)	Monomial	certain	all	coefficient
(C)	Binomial	certain	all	variable
(D)	Monomial	all	certain	coefficient

25. Simplify : $\frac{a^2 - 13a + 30}{(a - 10)} = \frac{a^2 + 4a + 4}{a + 2}$

(A) $a^2 - 8a - 20 = 0$
(B) $a^2 + 30a - 40 = 0$
(C) $a^2 - 80a - 30 = 0$
(D) $a^2 + 7a - 30 = 0$

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Darken your choice with HB Pencil

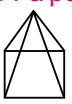
1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	8.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	15.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	22.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	16.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	23.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	10.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	17.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	24.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	11.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	18.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	25.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	12.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	19.	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	13.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	20.	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	14.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	21.	Ⓐ	Ⓑ	Ⓒ	Ⓓ					

CHAPTER

10 VISUALISING SOLID SHAPES

MATHEMATICAL REASONING

1. Which of the following is NOT a polyhedron?

(A)  (B) 

(C)  (D) 

2. Which of the following is top view of the given shape?

(A)  (B) 

(C)  (D) 

3. Which of the following is NOT a three dimensional shape?

(A) Square prism
(B) Sphere
(C) Triangular pyramid
(D) Circle

4. Euler's formula for any polyhedron, where F stands for the number of faces, V stands for the number of vertices and E stands for the number of edges is ____.

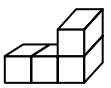
(A) $F + V + E = 2$ (B) $F - V + E = 2$
(C) $F + V - E = 2$ (D) $F - V - E = 2$

5. Which of the following is the net of a cone?

(A)  (B) 

(C)  (D) 

6. Find the total number of faces in the following shape.

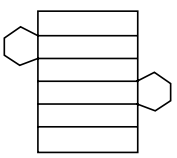
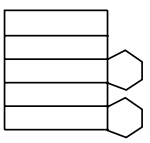


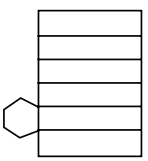
(A) 9 (B) 10
(C) 8 (D) 6

7. Which of the following CANNOT be true for polyhedron?

(A) Faces = 4, Vertices = 4, Edges = 6
(B) Faces = 8, Vertices = 6, Edges = 12
(C) Faces = 5, Vertices = 1, Edges = 8
(D) Faces = 20, Vertices = 12, Edges = 30

8. Which of the following is the net of a hexagonal prism?

(A)  (B) 

(C) 

(D) None of these

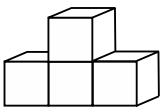
9. The number of faces in a square prism is _____.

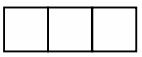
(A) 4 (B) 6
(C) 8 (D) None of these

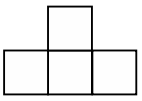
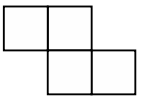
10. Number of faces, vertices and edges in the square pyramid are respectively ____.

(A) 4, 6, 12 (B) 7, 5, 10
(C) 5, 5, 8 (D) 4, 4, 6

11. Which one of the following is the top view of the given figure?



(A)  (B) 

(C)  (D) 

12. Solid having only line segments as its edges is a _____.

(A) Polyhedron (B) Cone
(C) Cylinder (D) Polygon

13. If a polyhedron has 12 vertices and 8 faces, then the number of edges of the polyhedron is _____.

(A) 12 (B) 14 (C) 16 (D) 18

14. Number of edges in a triangular prism is _____.

(A) 9 (B) 6 (C) 5 (D) 8

15. Which of the following will not form a polyhedron?

(A) 1 square and 4 triangles
(B) 2 triangles and 3 rectangles
(C) 3 triangles
(D) 1 pentagon and 5 triangles

ACHIEVERS SECTION (HOTS)

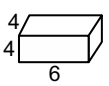
16. Using Euler's formula, find the values of P, Q, R and S respectively.

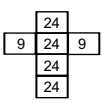
Faces	6	5	20	14
Vertices	**P**	**Q**	36	**R**
Edges	12	9	**S**	36

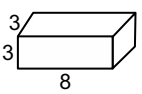
(A) 8, 6, 24, 54 (B) 8, 6, 56, 22
(C) 6, 8, 24, 54 (D) 7, 8, 56, 22

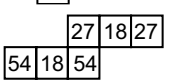
17. Match the following prisms given in Column-I with their respective nets (not drawn to scale) given in Column-II.

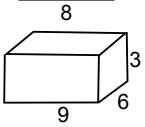
Column-I **Column-II**

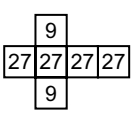
P. 

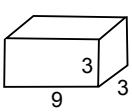
(i) 

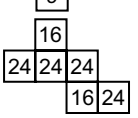
Q. 

(ii) 

R. 

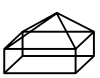
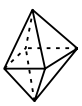
(iii) 

S. 

(iv) 

(A) P → (ii); Q → (iv); R → (i); S → (iii)
(B) P → (iv); Q → (i); R → (ii); S → (iii)
(C) P → (i); Q → (ii); R → (iii); S → (iv)
(D) P → (iii); Q → (i); R → (ii); S → (iv)

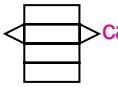
18. Select the INCORRECT match.

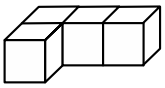
		Faces	Vertices	Edges
(A)		9	9	16
(B)		9	8	15
(C)		5	5	8
(D)		8	6	12

19. Fill in the blanks.

(i) A pyramid on an *n*-sided polygon has **P** faces.

(ii) A rectangular prism has **Q** faces.

(iii) The net  can be folded to make a **R**.

(iv)  is the **S** view of 

	P	Q	R	S
(A)	$n + 2$	8	rectangular prism	front
(B)	$n + 1$	6	triangular prism	top
(C)	$n - 1$	5	triangular pyramid	side
(D)	$n + 3$	4	rectangular prism	top

20. State 'T' for true and 'F' for false.

(i) Pentagonal prism has 5 pentagons

(ii) Euler's formula is true for all three dimensional figures.

(iii) All cubes are prism.

(iv) A polyhedron with least number of faces is known as a triangular pyramid.

	(i)	(ii)	(iii)	(iv)
(A)	F	T	T	F
(B)	T	T	T	F
(C)	F	T	F	T
(D)	F	F	T	T

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Darken your choice with HB Pencil

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**6.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**11.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**16.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**7.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**12.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**17.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**8.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**13.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**18.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**9.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**14.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**19.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**10.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**15.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**20.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ

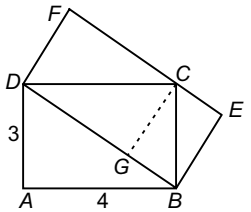
CHAPTER

11

MENSURATION

MATHEMATICAL REASONING

1. Two rectangles *ABCD* and *DBEF* are as shown in the figure. The area of rectangle *DBEF* (in square units) is _____.



(A) 10 (B) 12 (C) 14 (D) 15

2. The ratio of areas of two squares, if diagonal of one is double the diagonal of the other, is _____.

(A) 3 : 2 (B) 4 : 1
(C) 3 : 1 (D) 4 : 3

3. Ratio of surface areas of two cubes is 25 : 36. Find the ratio of their volumes.

(A) 5 : 6 (B) 125 : 216
(C) 1 : 2 (D) 64 : 216

4. The area of a quadrilateral is 342 sq. m. The perpendiculars from two of its opposite vertices to the diagonal are 12 m and 12 m. What is the length of the diagonal?

(A) 28.6 cm (B) 25.3 cm
(C) 28.5 cm (D) 22.5 cm

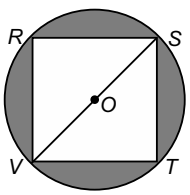
5. The radii of the bases of two cylinders are in the ratio of 1 : 2 respectively and their heights are in the ratio 2 : 1 respectively. Find the ratio of their volumes.

(A) 1 : 2 (B) 1 : 4
(C) 2 : 1 (D) 4 : 1

6. Find the sum of the lengths of the parallel sides of a trapezium whose altitude is 11 cm and whose area is 0.55 m^2.

(A) 25 m (B) 15 m
(C) 12 m (D) 10 m

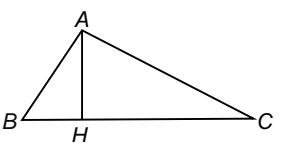
7. In the given figure, *RSTV* is a square inscribed in a circle with centre *O* and radius *r*. The total area of the shaded region is _____.



(A) $r^2(\pi - 2)$ (B) $2r^2(2 - \pi)$
(C) $\pi(r^2 - 2)$ (D) $8r^2 - 8r$

8. *ABC* is a right angled triangle with $\angle BAC = 90°$. *AH* is drawn perpendicular to *BC*. If *AB* = 60 cm and *AC* = 80 cm, then *BH* = _____.

(A) 36 cm
(B) 32 cm
(C) 24 cm
(D) 30 cm



9. Three cubes whose edges are 3 cm, 4 cm and 5 cm respectively are melted without any loss of metal into a single cube. The edge of the new cube is _____.

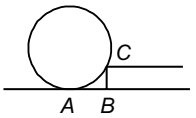
(A) 6 cm (B) 12 cm
(C) 9 cm (D) 10 cm

10. The volume of a cuboid is 440 cm^3 and the area of its base is 88 cm^2. Find its height.

(A) 5 cm (B) 11 cm
(C) 4 cm (D) 8 cm

11. A hoop is resting vertically at staircase as shown in the diagram. AB = 12 cm and BC = 8 cm. The radius of the hoop is _____.

(A) 13 cm
(B) $12\sqrt{2}$ cm
(C) 14 cm
(D) $13\sqrt{2}$ cm



12. The capacity of a closed cylindrical water tank is 9.24 kilolitres. If the height of the cylinder is 1.5 m, what is its radius?

(A) 1.4 m (B) 14 m
(C) 7m (D) 0.7 m

13. The thickness of a hollow metallic cylinder is 2 cm. It is 70 cm long with outer radius of 14 cm. Find the volume of the metal used in making the cylinder, assuming that it is open at both the ends. Also find its weight if the metal weighs 8 g per cm^3.

(A) 10440 cm^3, 91250 g
(B) 13440 cm^3, 90000 g
(C) 11440 cm^3, 91520 g
(D) 12440 cm^3, 91550 g

14. A wooden box (including the lid) has external dimensions 40 cm by 34 cm by 30 cm. If the wood is 1 cm thick, then how many cm^3 of wood is used in it?

(A) 6752 cm^3 (B) 6750 cm^3
(C) 5752 cm^3 (D) 5750 cm^3

15. How many bricks of size 22 cm × 10 cm × 7 cm are required to construct a wall 11m long, 3.5 m high and 40 cm thick, if the cement and sand used in the construction occupy $(1/10)^{th}$ part of the wall?

(A) 8000 (B) 9000
(C) 7000 (D) 10000

16. A rectangular block of ice measures 40 cm by 25 cm by 15 cm. Calculate its weight (in kg), if ice weighs $\frac{9}{10}$ of the weight of the same volume of water and 1 cm^3 of water weighs 1 gm.

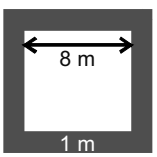
(A) 9 (B) 13.5
(C) 8 (D) 9.5

17. A cylindrical tower is 5 metres in diameter and 14 metres high. The cost of white washing its curved surface at 50 paise per m^2 is _____.

(A) ₹ 90
(B) ₹ 97
(C) ₹ 110
(D) ₹ 95

18. A square garden measuring 8 m on a side is surrounded by a 1 m wide path. What is the area of the path ?

(A) 8 m^2
(B) 9 m^2
(C) 28 m^2
(D) 36 m^2



19. A well 12 m deep with a diameter 3.5 m is dug up and earth from it is evenly spread to form a platform 10.5 m long and 8.8 m wide. Find the height of the platform.

(A) 2.5 m
(B) 12.5 m
(C) 1.25 m
(D) 1.5 m

20. A room is 9 m long, 6 m wide and 4 m high. Find the cost of plastering its walls and ceiling at the rate of ₹ 2.50 per square metre.

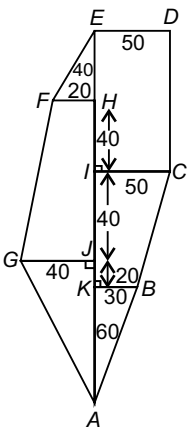
(A) ₹ 435 (B) ₹ 600
(C) ₹ 502 (D) ₹ 354

ACHIEVERS SECTION (HOTS)

21. A solid iron rectangular block of dimensions 4.4 m, 2.6 m and 1 m is cast into a hollow cylindrical pipe of internal radius 30 cm and thickness 5 cm. Find the length of the pipe.

(A) 112.5 m
(B) 112 m
(C) 212 m
(D) 312 m

22. Find the area of the given field. All dimensions are in m.



(A) 9000 m²
(B) 11700 m²
(C) 11000 m²
(D) 12000 m²

23. Fill in the blanks.

(i) The perimeter of a rectangle becomes _____ times its original perimeter, if its length and breadth are doubled.

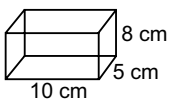
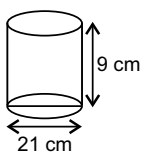
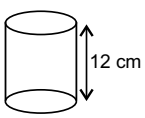
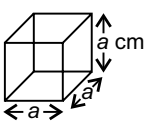
(ii) The curved surface area of a cylinder is reduced by _____ percent if the height is half of the original height.

(iii) Opposite faces of a cuboid are _____ in area.

(iv) If the diagonal d of a quadrilateral is doubled and the heights h_1 and h_2 falling on d are halved, then the new area of quadrilateral is _____.

	(i)	(ii)	(iii)	(iv)
(A)	2	50	equal	$\frac{1}{2}(h_1 + h_2)d$
(B)	2	35	unequal	$\frac{1}{2}(h_1 + h_2)d$
(C)	3	40	equal	$(h_1 + h_2)d$
(D)	3	35	unequal	$(h_1 + h_2)d$

24. Match the figure in column I with their total surface area in column II

Column I		Column II
(P)		(i) 836 cm²
(Q)		(ii) 340 cm²
(R)	 Area of base = 154 cm²	(iii) 1014 cm²
(S)	 Volume = 2197 cm³	(iv) 1287 cm²

(A) P → (iii); Q → (ii); R → (iv); S → (i)
(B) P → (ii); Q → (iv); R → (i); S → (iii)
(C) P → (ii); Q → (iii); R → (i); S → (iv)
(D) P → (ii); Q → (iv); R → (iii); S → (i)

25. The area of a trapezium with equal non-parallel sides is 168 m^2. If the lengths of the parallel sides are 36 m and 20 m, find the length of the non-parallel sides.

(A) 8 m (B) 10 m

(C) 15 m (D) 4 m

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Darken your choice with HB Pencil

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**8.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**15.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**22.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**9.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**16.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**23.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**10.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**17.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**24.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**11.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**18.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**25.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**12.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**19.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**13.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**20.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**14.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**21.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					

CHAPTER

12 EXPONENTS AND POWERS

MATHEMATICAL REASONING

1. The value of $\frac{2^{2001}+2^{1999}}{2^{2000}-2^{1998}}$, is ____.

(A) 2 (B) 10/3
(C) $2^{1000}+1$ (D) 10

2. When simplified, $(x^{-1}+y^{-1})^{-1}$ is equal to ____.

(A) $x+y$ (B) $\frac{xy}{x+y}$
(C) xy (D) $\frac{1}{xy}$

3. The value of $x + x(x^x)$ at $x = 2$ is ____.

(A) 10 (B) 16
(C) 18 (D) 36

4. Simplify :

$$\left(\frac{x^a}{x^b}\right)^{(a^2+b^2+ab)} \times \left(\frac{x^b}{x^c}\right)^{(b^2+c^2+cb)} \times \left(\frac{x^c}{x^a}\right)^{(c^2+a^2+ca)}$$

(A) 1 (B) $(a+b+c)^3$
(C) $a^2+b^2+c^2$ (D) 0

5. If $(6x)^6 = 6^{2^3}$, then find the value of x.

(A) 1 (B) $\sqrt{6}$
(C) $\sqrt[3]{6}$ (D) $\sqrt[6]{6}$

6. Find the value of $(0.000064)^{\frac{5}{6}} \div (0.00032)^{\frac{6}{5}}$.

(A) 0.2 (B) 0.4 (C) 5 (D) 2.5

7. If $x = \left(\frac{3}{2}\right)^2 \times \left(\frac{2}{3}\right)^{-4}$, find the value of x^{-2}.

(A) $\left(\frac{4}{3}\right)^{12}$ (B) $\left(\frac{2}{3}\right)^{12}$
(C) $\left(\frac{3}{2}\right)^{12}$ (D) $\left(\frac{3}{4}\right)^{12}$

8. If $a^x = b^y = c^z$ and $b^2 = ac$, then y equals

(A) $\frac{2xz}{x+z}$ (B) $\frac{xz}{2(x-z)}$
(C) $\frac{xz}{2(z-x)}$ (D) $\frac{2xz}{(x-z)}$

9. If $\frac{10}{3} \times 3^x - 3^{x-1} = 81$, then the value of x is ____.

(A) 2 (B) 1
(C) 3 (D) 0

10. Which of the following values are equal ?

P. 1^4 Q. 4^0
R. 0^4 S. 4^1
(A) P and Q (B) Q and R
(C) P and R (D) P and S

11. The value of $(7^{-1}-8^{-1})^{-1} - (3^{-1}-4^{-1})^{-1}$ is

(A) 56 (B) 12
(C) 68 (D) 44

12. When $5 \times 10^{-3} - 2000 \times 10^{-6}$ is expressed in standard form, we will get

(A) 3×10^{-2} (B) 3×10^{-3}
(C) 3×10^3 (D) 3×10^2

13. If $3^{(x-y)} = 27$ and $3^{(x+y)} = 243$, then x is equal to _____.

(A) 0 (B) 2
(C) 4 (D) 6

14. Number of prime factors in $(216)^{\frac{3}{5}} \times (2500)^{\frac{2}{5}} \times (300)^{\frac{1}{5}}$ is _____.

(A) 6 (B) 9
(C) 8 (D) None of these

15. Find x, if $\left(\frac{5}{11}\right)^{-3} \times \left(\frac{5}{11}\right)^{5} = \left(\frac{5}{11}\right)^{x}$.

(A) 3 (B) 4
(C) 8 (D) 2

EVERYDAY MATHEMATICS

16. The size of a red blood cell is 0.000007 m and the size of a plant cell is 0.00001275 m. Find the ratio of the size of red blood cell to that of plant cell.

(A) 13 : 56 (B) 28 : 51
(C) 31 : 39 (D) 22 : 31

17. Pluto is 5913000000 km away from the Sun. Express this distance in standard form.

(A) 5.913×10^{-11} (B) 5.913×10^{-9}
(C) 5.913×10^{6} (D) 5.913×10^{9}

18. The cell of bacteria doubles itself after every 1 hour. How many cells will there be after 8 hours?

(A) 200 times of the original
(B) 2^{10} times of the original
(C) 2^{8} times of the original
(D) 2^{6} times of the original

19. At the end of the 20th century, the world's population was approximately 6.125×10^{9}. Express this population in usual form.

(A) 6.125×10^{10} (B) 6125000000
(C) 6125×10^{5} (D) 61250000

20. Weight of moon is (7.346×10^{22}) kg and weight of Earth is (5.9724×10^{24}) kg. What is the total weight of both in standard form?

(A) 6.04×10^{24} kg (B) 7.08×10^{22} kg
(C) 5.98×10^{24} kg (D) 6.44×10^{24} kg

ACHIEVERS SECTION (HOTS)

21. Simplify : $\dfrac{\left[\frac{2}{3}\right]^{3} \times \left[\frac{2}{3}\right]^{-2} \times \left[\left(\frac{1}{2}\right)^{2}\right]^{-2} \times \frac{1}{24}}{\left(\frac{2}{3}\right)^{-5} \times \left(\frac{3}{2}\right)^{-12}}$

(A) $\left(\frac{2}{3}\right)^{-4}$ (B) $\frac{32}{3}$

(C) $\frac{243}{16}$ (D) $\frac{243}{32}$

22. Solve for y, if

$$\frac{\left(\frac{1}{9}\right)^{2y-1} (.0081)^{1/3}}{\sqrt{243}} = \left(\frac{1}{3}\right)^{2y-5} \sqrt[3]{\frac{27^{y-1}}{10000}}$$

(A) $\frac{1}{2}$ (B) $-\frac{19}{18}$

(C) $\frac{3}{10}$ (D) $\frac{12}{17}$

23. Fill in the blanks.

(i) If $m^2 = 27^{2/3} \times 16^{-3/2}$, then m = **P**

(ii) If $ab = 1$, then $\frac{1}{1+a^{-1}} + \frac{1}{1+b^{-1}}$ = **Q**

(iii) If $x = (8^{2/3} \cdot 32^{-2/5})$, then x^{-5} = **R**

	P	Q	R
(A)	5/4	0	10/7
(B)	1	1	5/16
(C)	3/8	1	1
(D)	7/8	0	7/8

24. Match the following.

Column-I		Column-II	
(P)	$\left(6^{-1}+\left(\frac{3}{2}\right)^{-1}\right)^{-1}$	(i)	$-\frac{4}{13}$
(Q)	$\left\{\left(\frac{4}{3}\right)^{-1}-\left(\frac{1}{4}\right)^{-1}\right\}^{-1}$	(ii)	$\frac{9}{32}$
(R)	$\left[\left(\frac{1}{3}\right)^{-3}-\left(\frac{1}{2}\right)^{-3}\right]\div\left(\frac{1}{4}\right)^{-3}$	(iii)	$\frac{6}{5}$
(S)	$(3^{-1}\times 4^{-1})\times\left(\frac{2}{3}\right)^{-3}$	(iv)	$\frac{19}{64}$

(A) (P) → (iii); (Q) → (i); (R) → (iv); (S) → (ii)
(B) (P) → (iv); (Q) → (i); (R) → (ii); (S) → (iii)
(C) (P) → (ii); (Q) → (iii); (R) → (iv); (S) → (i)
(D) (P) → (iii); (Q) → (i); (R) → (ii); (S) → (iv)

25. If $a = (2^{-2} - 2^{-3})$, $b = (2^{-3} - 2^{-4})$ and $c = (2^{-4} - 2^{-2})$ then find :
(i) $a^3 + b^3 + c^3$ (ii) $10\,abc$

	(i)	**(ii)**
(A)	9/2048	7/2048
(B)	3/1024	5/2048
(C)	–3/1024	–10/2048
(D)	–9/2048	–15/1024

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1.	Ⓐ Ⓑ Ⓒ Ⓓ	**8.**	Ⓐ Ⓑ Ⓒ Ⓓ	**15.**	Ⓐ Ⓑ Ⓒ Ⓓ	**22.**	Ⓐ Ⓑ Ⓒ Ⓓ
2.	Ⓐ Ⓑ Ⓒ Ⓓ	**9.**	Ⓐ Ⓑ Ⓒ Ⓓ	**16.**	Ⓐ Ⓑ Ⓒ Ⓓ	**23.**	Ⓐ Ⓑ Ⓒ Ⓓ
3.	Ⓐ Ⓑ Ⓒ Ⓓ	**10.**	Ⓐ Ⓑ Ⓒ Ⓓ	**17.**	Ⓐ Ⓑ Ⓒ Ⓓ	**24.**	Ⓐ Ⓑ Ⓒ Ⓓ
4.	Ⓐ Ⓑ Ⓒ Ⓓ	**11.**	Ⓐ Ⓑ Ⓒ Ⓓ	**18.**	Ⓐ Ⓑ Ⓒ Ⓓ	**25.**	Ⓐ Ⓑ Ⓒ Ⓓ
5.	Ⓐ Ⓑ Ⓒ Ⓓ	**12.**	Ⓐ Ⓑ Ⓒ Ⓓ	**19.**	Ⓐ Ⓑ Ⓒ Ⓓ		
6.	Ⓐ Ⓑ Ⓒ Ⓓ	**13.**	Ⓐ Ⓑ Ⓒ Ⓓ	**20.**	Ⓐ Ⓑ Ⓒ Ⓓ		
7.	Ⓐ Ⓑ Ⓒ Ⓓ	**14.**	Ⓐ Ⓑ Ⓒ Ⓓ	**21.**	Ⓐ Ⓑ Ⓒ Ⓓ		

CHAPTER

13

DIRECT AND INVERSE PROPORTIONS

MATHEMATICAL REASONING

1. If $x : y = 2 : 3$ and $2 : x = 1 : 2$, then the value of y is _____.
(A) 1/3 (B) 3/2 (C) 6 (D) 1/2

2. If x and y vary inversely as each other, and $x = 10$ when $y = 6$. Find y when $x = 15$.
(A) 3 (B) 4 (C) 2 (D) 6

3. If x varies directly as y^2 and $x = 4$ when $y = 5$, then find x when y is 15.
(A) 4 (B) 9 (C) 12 (D) 36

4. If $\frac{1}{5} : \frac{1}{x} = \frac{1}{x} : \frac{1}{125}$, then the value of x is _____.
(A) 1.25 (B) 1.5 (C) 25 (D) 2.25

5. x and y vary in inverse proportion. When x is 12, y is 3. Which of the following is not a possible pair of corresponding values of x and y ?
(A) 4 and 9 (B) 10 and 3.6
(C) 72 and 0.5 (D) 5 and 6

6. Which of the following statements is CORRECT?
(A) Length of a side of square and its area vary directly with each other.
(B) If one angle of a triangle is kept fixed then the measure of the remaining two angles vary inversely with each other.
(C) The area of circle and its diameter vary directly with each other.
(D) All of these

7. If $A : B = 2 : 3$ and $B : C = 4 : 5$, then $C : A$ is equal to _____.
(A) 15 : 8 (B) 12 : 10
(C) 8 : 5 (D) 8 : 15

8. Match the following.

Column-I	Column-II
P. x and y are in direct proportion and $x = 40$ when $y = 120$. If $x = 60$ then y =	(i) 160
Q. x varies inversely as y and $x = 12$ when $y = 300$, if $x = 24$ then y =	(ii) 180
R. x varies directly as y and $y = 50$ when $x = 30$, if $x = 96$ then y =	(iii) 130
S. x varies inversely as y and $y = 650$ when $x = 20$, if $x = 100$ then y =	(iv) 150

(A) P → (iv); Q → (i); R → (iii); S → (ii)
(B) P → (ii); Q → (iv); R → (iii); S → (i)
(C) P → (iv); Q → (i); R → (ii); S → (iii)
(D) P → (ii); Q → (iv); R → (i); S → (iii)

9. When $x = 2, 7, 11, ...$, $y = 8, 28, 44, ...$, then x and y are in ..... .
(A) Direct proportion
(B) Inverse proportion
(C) Neither direct nor inverse proportion
(D) None of these

10. Two quantities x and y vary inversely with each other, then _____ .
(A) x/y remains constant
(B) $x - y$ remains constant
(C) $x + y$ remains constant
(D) $x \times y$ remains constant

EVERYDAY MATHEMATICS

11. 8 men can do a piece of work in 10 days. How long will 10 men take to do the same work?
(A) 12 days (B) 8 days
(C) 7 days (D) 6 days

12. An agent receives a commission of ₹ 73.00 on sales of ₹ 1000.00. The commission he will get on sales of ₹ 100.00 is ____.
(A) ₹ 7.30 (B) ₹ 7.00
(C) ₹ 6.00 (D) ₹ 6.30

13. In a birthday party, on an average, 5 bottles of coke are served for a group of 6 children. How many friends were present at Mohit's party if 15 bottles of coke were used?
(A) 18 (B) 24 (C) 30 (D) 12

14. In a camp there is sufficient food for 105 soldiers for 21 days. If 42 soldiers leave the camp, then how long would the food last?
(A) 30 days (B) 35 days
(C) 65 days (D) 45 days

15. A shopkeeper has just enough money to buy 52 cycles worth ₹ 525 each. If each cycle were to cost ₹ 21 more, then number of cycles, he will be able to buy with that amount of money, is ____.
(A) 40 (B) 30 (C) 50 (D) 20

16. A labourer is paid ₹ 806 for 13 days of work. If he receives ₹ 1,798, then for how many days did he work?
(A) 29 (B) 35 (C) 60 (D) 40

17. A photograph of a bacteria enlarged 50,000 times, attains a length of 5 cm. What is the actual length of the bacteria?
(A) 2×10^{-4} cm (B) 10^3 cm
(C) 10^{-4} cm (D) 10^4 cm

18. Raghu has enough money to buy 75 machines worth ₹ 200 each. How many machines can he buy if he gets a discount of ₹ 50 on each machine?
(A) 180 (B) 200 (C) 150 (D) 100

19. A cistern has two inlets *A* and *B* which can fill it in 12 minutes and 15 minutes respectively. An outlet *C* can empty the full cistern in 10 minutes. If all the three pipes then are opened together in the empty cistern, time taken to fill the cistern completely is ____.
(A) 20 minutes (B) 10 minutes
(C) 15 minutes (D) 5 minutes

20. In 15 days, the earth picks up 1.2×10^8 kg of dust from the atmosphere. In how many days it will pick up 4.8×10^8 kg of dust?
(A) 50 (B) 40 (C) 60 (D) 100

ACHIEVERS SECTION (HOTS)

21. State 'T' for true and 'F' for false.
(i) If *x* and y are in direct proportion, then $(x - 1)$ and $(y - 1)$ are also in direct proportion.
(ii) If *x* and *y* are in inverse proportion then $(x + 2)$ and $(y + 2)$ are also in inverse proportion.
(iii) Two quantities *x* and *y* are said to vary directly with each other if $\frac{x}{y} = k$, where *k* is a positive constant.
(iv) When distance is kept fixed, then speed and time vary inversely with each other.

	(i)	(ii)	(iii)	(iv)
(A)	T	F	F	T
(B)	T	T	F	F
(C)	F	F	T	T
(D)	T	F	T	F

22. Fill in the blanks.
(i) The perimeter of circle and its diameter vary **P** with each other.

(ii) If two quantities p and q vary inversely with each other then __Q__ of their corresponding values remain constant.

(iii) When x and y are in indirect proportion and if y doubles then x becomes __R__.

	P	Q	R
(A)	Inversely	Ratio	Double
(B)	Directly	Product	Half
(C)	Inversely	Ratio	Half
(D)	Directly	Product	Double

23. Match the following.

	Column-I	Column-II
(P)	If the cost of 93 m of a certain kind of plastic sheet is ₹ 1395, then what would it cost (in ₹) to buy 105 m of such plastic sheet?	(1) 42
(Q)	55 cows can graze a field in 16 days. How many cows will graze the same field in 10 days?	(2) 18
(R)	18 men can reap a field in 35 days. For reaping the same field in 15 days; how many men are required?	(3) 88
(S)	Suneeta types 1080 words in one hour. What is her GWPM (gross words per minute)?	(4) 1575

	P	Q	R	S
(A)	4	3	1	2
(B)	2	1	4	3
(C)	3	2	1	4
(D)	1	3	2	4

24. A worker is paid ₹ 139.20 for 3 days.

(i) What will he get in the month of June (in ₹)?

(ii) For how many days will he be working for ₹ 696?

	(i)	(ii)
(A)	1392	15
(B)	15	1392
(C)	1382	20
(D)	1392	20

25. Which of the following tables shows the inverse proportion?

(i)

x	6	12	30	48
y	250	125	50	31.25

(ii)

x	115	130	145	160
y	615	600	585	570

(iii)

x	50	100	300	1200
y	300	150	100	75

(A) Only (i)
(B) Both (i) and (ii)
(C) Both (ii) and (iii)
(D) None of these

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Darken your choice with HB Pencil

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**8.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**15.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**22.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**9.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**16.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**23.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**10.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**17.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**24.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**11.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**18.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**25.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**12.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**19.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**13.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**20.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**14.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**21.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ					

CHAPTER

14

FACTORISATION

MATHEMATICAL REASONING

1. Factorisation of $xy - pq + qy - px$ is _____.

(A) $(y - p)(x + q)$

(B) $(y - p)(x - q)$

(C) $(y + p)(x + q)$

(D) $(y + p)(x - q)$

2. If $(x^2 + 3x + 5)(x^2 - 3x + 5) = m^2 - n^2$, then m = _____.

(A) $x^2 - 3x$

(B) $3x$

(C) $x^2 + 5$

(D) Both (A) and (B)

3. The factors of $\frac{x^2}{4} - \frac{y^2}{9}$ are _____.

(A) $\left(\frac{x}{4} + \frac{y}{9}\right)\left(\frac{x}{4} - \frac{y}{9}\right)$

(B) $\left(\frac{x}{2} + \frac{y}{9}\right)\left(\frac{x}{2} - \frac{y}{9}\right)$

(C) $\left(\frac{x}{2} + \frac{y}{3}\right)\left(\frac{x}{2} - \frac{y}{3}\right)$

(D) Both (A) and (B)

4. The factors of $15x^2 - 26x + 8$ are _____.

(A) $(3x - 4)(5x + 2)$

(B) $(3x - 4)(5x - 2)$

(C) $(3x + 4)(5x - 2)$

(D) $(3x + 4)(5x + 2)$

5. The factors of $x^2 - 16$ are _____.

(A) $(x^2 + 2)(x^2 - 2)$

(B) $(x + 4)(x - 4)$

(C) $(x + 2)(x - 2)$

(D) Does not exist

6. The factors of $\sqrt{3}x^2 + 11x + 6\sqrt{3}$ are _____.

(A) $\left(x - 3\sqrt{3}\right)\left(\sqrt{3}x + 2\right)$

(B) $\left(x - 3\sqrt{3}\right)\left(\sqrt{3}x - 2\right)$

(C) $\left(x + 3\sqrt{3}\right)\left(\sqrt{3}x - 2\right)$

(D) $\left(x + 3\sqrt{3}\right)\left(\sqrt{3}x + 2\right)$

7. Factors of $x^4 - (x - z)^4$ are _____.

(A) $(2x + z)(2x^3 + z^3 - 2x^2)$

(B) $z(x + 2z)(x^2 + z^2 - x^2)$

(C) $z(2x - z)(2x^2 - 2xz + z^2)$

(D) $z(x - 2z)(2z^2 - 2xz + x^2)$

8. Factorising $(x - y)^2 + 4xy - z^2$, we get

(A) $(x + y + z)(x + y - z)$

(B) $(x - y - z)(x + y - z)$

(C) $(x - y + z)(x + y - z)$

(D) None of these

9. The factors of $x^4 + y^4 + x^2y^2$ are _____.

(A) $(x^2 + y^2)(x^2 + y^2 - xy)$

(B) $(x^2 + y^2)(x^2 - y^2)$

(C) $(x^2 + y^2 + xy)(x^2 + y^2 - xy)$

(D) Factorisation is not possible

10. For $x^2 + 2x + 5$ to be a factor of $x^4 + px^2 + q$, the values of p and q must be ____.

(A) $-2, 5$ (B) $5, 25$
(C) $10, 20$ (D) $6, 25$

11. One of the factors of $4(x + y)(3a - b) + 6(x + y)(2b - 3a)$ is

(A) $(2b - 3a)$ (B) $(3a - b)$
(C) $(4a - 3b)$ (D) $(-3a + 4b)$

12. Divide $(32x^4y^3 - 16x^3y^4)$ by $(-8x^2y)$

(A) $4x^3y^2 + 2xy^3$ (B) $4x^3y - 2xy^3$
(C) $-4x^2y^2 + 2xy^3$ (D) $-4xy^2 + 2xy^3$

13. One of the factors of $(p + q)^2 - (a - b)^2 + p + q - a + b$ is

(A) $(p + q + a + b)$ (B) $(p + q - a + b)$
(C) $(p - q + a - b)$ (D) $(p - q + a + b)$

14. Factorise: $(2x + 3y)^2 - 5(2x + 3y) - 14$.

(A) $4(2x + 3y)(x + y - 2)$
(B) $4(2x + 3y)(x + y + 2)$
(C) $(2x - 3y + 7)(2x - 3y + 2)$
(D) $(2x + 3y - 7)(2x + 3y + 2)$

15. Simplify : $\dfrac{-14x^{12}y + 8x^5z}{2x^2}$

(A) $x^3(-7x^7y + 4z)$ (B) $x^2(7x^7y - 4z)$
(C) $x^2(-7x^6y + 2z)$ (D) $x^3(7x^7y + 4z)$

ACHIEVERS SECTION (HOTS)

16. Which of the following is the factor of $12(a^2 + 7a)^2 - 8(a^2 + 7a)(2a - 1) - 15(2a - 1)^2$?

(i) $(2a^2 + 8a + 3)$ (ii) $(6a^2 + 52a - 5)$
(iii) $(3a + 5)$

(A) Only (i) (B) Both (i) and (ii)
(C) Only (ii) (D) All (i), (ii) and (iii)

17. Fill in the blanks.

(i) $\dfrac{a^2 - b^2}{a(a - b)} - \dfrac{ab^2 + a^2b}{ab^2}$ is equal to **P**.

(ii) $\dfrac{64y^4 + 8y^3}{4y^3}$ is equal to **Q**.

(iii) When we divide $(38a^3b^3c^2 - 19a^4b^2c)$ by $19a^2bc$, the result is $kab^2c - a^2b$. Then k = **R**.

	P	Q	R
(A)	$\dfrac{(a+b)(b-a)}{ab}$	$3(8y + 1)$	2
(B)	$\dfrac{(a+b)(b-a)}{ab}$	$3(8y + 1)$	1
(C)	$\dfrac{(a+b)(a-b)}{ab}$	$2(8y + 1)$	1
(D)	$\dfrac{(a+b)(b-a)}{ab}$	$2(8y + 1)$	2

18. Which of the following statements is CORRECT?

(A) The factors of an expression are always either algebraic variable or algebraic expression.

(B) An irreducible factor is a factor that cannot be expressed further as a product of factors.

(C) Every binomial expression can be factorised into two monomial expression.

(D) The process of writing a given expression as the product of two or more factors is called multiplication of factors.

19. Match the expression given in Column-I to one of their factors given in Column-II.

	Column-I	Column-II
P.	$9x^2 + 24x + 16$	(i) $(2x - 4)$
Q.	$25x^2 + 30x + 9$	(ii) $(4x + 1)$
R.	$40x^2 + 14x + 1$	(iii) $(5x + 3)$
S.	$4x^2 - 16x + 16$	(iv) $(3x + 4)$

(A) P $\rightarrow$ (iv); Q $\rightarrow$ (iii); R $\rightarrow$ (ii); S $\rightarrow$ (i)
(B) P $\rightarrow$ (iii); Q $\rightarrow$ (i); R $\rightarrow$ (iv); S $\rightarrow$ (ii)

(C) P → (ii); Q → (i); R → (iv); S → (iii)

(D) P → (iv); Q → (iii); R → (i); S → (ii)

20. Do as directed.

(i) Factorise: $x^2 + \frac{1}{x^2} - 3$

(ii) Find the greatest common factors of $14x^2y^3$, $21x^3y^2$ and $35x^4y^5z$.

(iii) Divide $z(5z^2 - 80)$ by $5z(z + 4)$.

	(i)	(ii)	(iii)
(A)	$\left(x-\frac{1}{x}\right)\left(x-\frac{1}{x}-2\right)$	$7xy^2$	$z-4$
(B)	$\left(x+\frac{1}{x}\right)\left(x+\frac{1}{x}+2\right)$	$7x^2y$	$z-4$
(C)	$\left(x-\frac{1}{x}+1\right)\left(x-\frac{1}{x}-1\right)$	$7x^2y^2$	$z-4$
(D)	$\left(x-\frac{1}{x}-1\right)\left(x+\frac{1}{x}+1\right)$	$7x^2y^2$	$z-2$

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Darken your choice with HB Pencil

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**6.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**11.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**16.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**7.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**12.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**17.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**8.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**13.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**18.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**9.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**14.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**19.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**10.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**15.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**20.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ

CHAPTER

15 INTRODUCTION TO GRAPHS

MATHEMATICAL REASONING

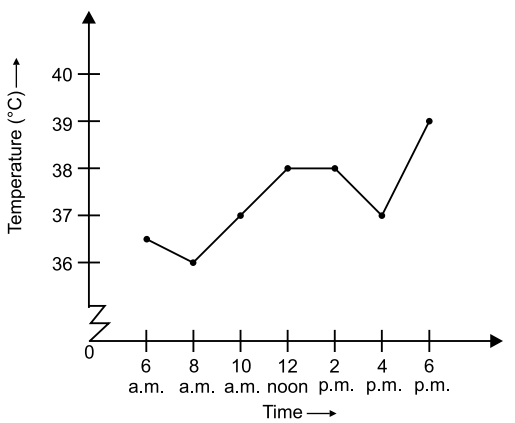
1. (0, – 3) lies on _____.

(A) Positive *x*-axis (B) Negative *x*-axis
(C) Positive *y*-axis (D) Negative *y*-axis

2. To draw the graph of a line, the least number of points required is _____.

(A) One (B) Two (C) Three (D) Four

DIRECTION (3-4) : The following graph shows the temperature of a patient admitted in a hospital, recorded every 2 hours.



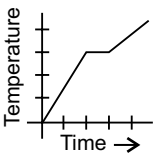
3. What was the patient's temperature at 3 p.m.?

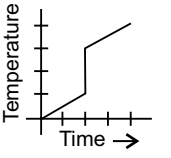
(A) 37.5 °C (B) 38 °C
(C) 36 °C (D) 37 °C

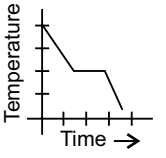
4. When was the patient's temperature highest ?

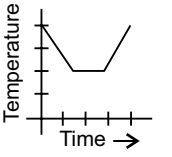
(A) 10 a.m. (B) 6 p.m.
(C) 4 p.m. (D) 2 p.m.

5. Which of the following graphs cannot be a time temperature graph?

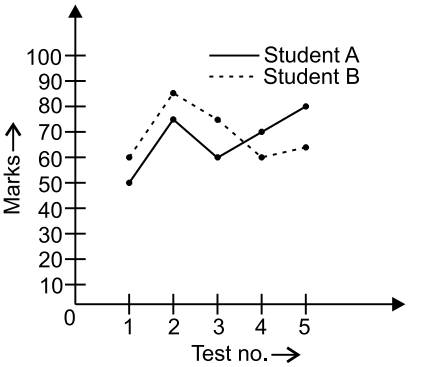
(A)


(B)


(C)


(D)


DIRECTION (6-7) : The line graph shows the performance of two students during a year. Read the graph and answer the following questions.



6. In which test student B showed his worst performance?

(A) Test 5 (B) Test 3
(C) Test 2 (D) Test 1

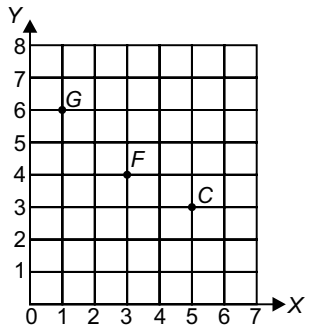
7. In all, whose performance is better during the year?

(A) Student A
(B) Both showed same performance
(C) Student B
(D) Can't be determined

8. The point of intersection of co-ordinate axes is called _____.

(A) Common point (B) Zero point
(C) Origin (D) Null point

DIRECTION (9-10) : Observe the given graph and answer the following questions.



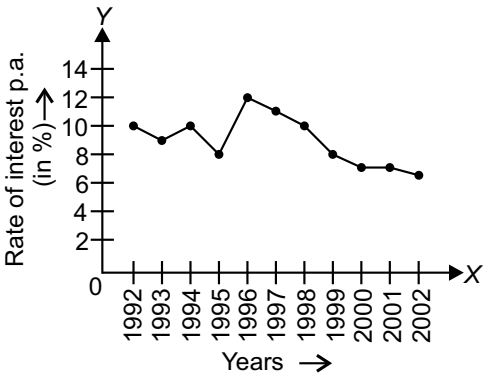
9. The coordinate of *F* is

(A) (4, 3) (B) (3, 4)
(C) (3, 3) (D) (4, 4)

10. The difference between *y*-coordinate of *G* and *C* is

(A) 3 (B) 2
(C) 4 (D) 1

DIRECTION (11-12): The graph shown below exhibits the rate of interest on fixed deposits upto one year announced by the Reserve Bank of India in different years. Read the graph and answer the following questions.



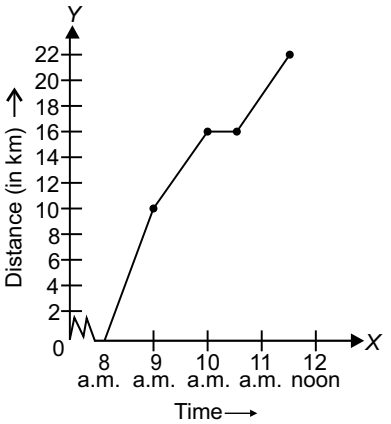
11. The difference between maximum and minimum rate of interest is _____.

(A) 3% (B) 6%
(C) 4% (D) 5%

12. The sum of rate of interest in 1993 and 1998 is _____.

(A) 12.5% (B) 13%
(C) 10% (D) 19%

DIRECTION (13-15) : A courier person cycles from a town to a neighbouring sub-urban area to deliver a parcel to a merchant. His distance from the town at different times is shown by the following graph.



13. How much time did the person take to reach the place of merchant?

(A) 3.5 hours (B) 2 hours
(C) 1.5 hours (D) 3 hours

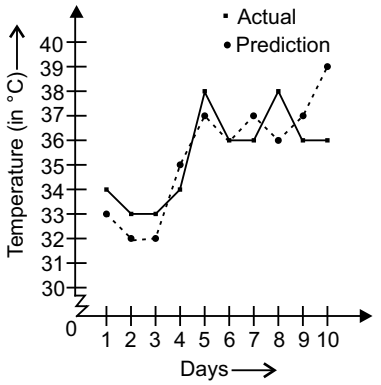
14. How far is the place of merchant from the town?

(A) 19 km (B) 18 km
(C) 22 km (D) 20 km

15. During which period did he ride fastest?

(A) 9 a.m. - 10 a.m.
(B) 10 a.m. - 11 a.m.
(C) 8 a.m. - 9 a.m.
(D) 11 a.m. - 11:30 a.m.

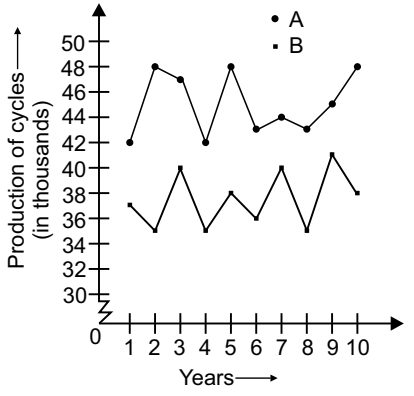
16. The graph shows the temperature forecast and the actual temperature of a city on ten days.



On what day, the graph shows the maximum deviation of actual temperature from the forecast?

(A) Day 10 (B) Day 8
(C) Day 5 (D) Day 4

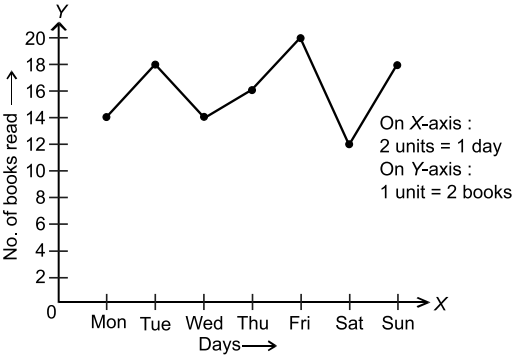
17. The graph shows the production of cycles (in thousands) of two factories A and B for ten years.



Find the production of cycles of A in the year when combined production of cycles was maximum.

(A) 47 thousands
(B) 48 thousands
(C) 49 thousands
(D) 46 thousands

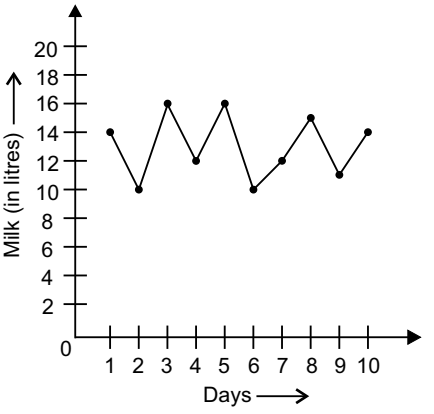
18. The following graph shows the number of books read by Ashok in a week.



Find the ratio of number of books read on Tuesday and Wednesday together to the total number of books read.

(A) 2 : 7 (B) 3 : 7
(C) 1 : 7 (D) 6 : 7

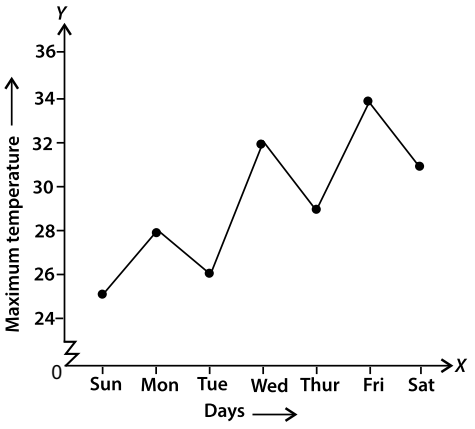
19. The following graph shows the amount of milk (in litres) that a milkman sold over 10 days.



On an average, how much milk he sells every day?

(A) 10 litres (B) 12.5 litres
(C) 11 litres (D) 13 litres

20. Study the graph and answer the questions that follow.



(a) On which day was the temperature 31°C?

(b) On which day was the temperature the least?

(c) Which was the hottest day?

	(a)	(b)	(c)
(A)	Saturday	Sunday	Friday
(B)	Sunday	Monday	Tuesday
(C)	Monday	Sunday	Friday
(D)	Wednesday	Saturday	Wednesday

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Darken your choice with HB Pencil

1.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**6.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**11.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**16.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
2.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**7.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**12.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**17.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
3.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**8.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**13.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**18.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
4.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**9.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**14.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**19.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ
5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**10.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**15.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	**20.**	Ⓐ	Ⓑ	Ⓒ	Ⓓ