



INDIAN SCHOOL DARSAIT
ANNUAL EXAMINATION, FEBRUARY 2018



MATHEMATICS
SAMPLE PAPER-2

Class : IX

Time: 3 Hours

Maximum Marks: 80

General Instructions:

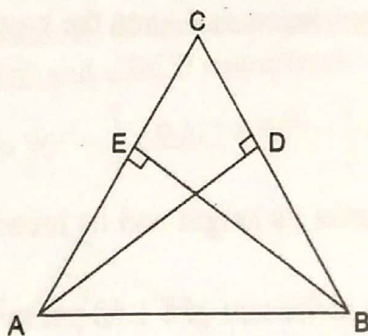
- (i) All questions are compulsory.
- (ii) Questions 1–6 in **Section-A** are Very Short Answer Type Questions carrying 1 mark each.
- (iii) Questions 7–12 in **Section-B** are Short Answer (SA-I) Type Questions carrying 2 marks each.
- (iv) Questions 13–22 in **Section-C** are Short Answer (SA-II) Type Questions carrying 3 marks each.
- (v) Questions 23–30 in **Section-D** are Long Answer Type Questions carrying 4 marks each.

SECTION-A

1. If $(16)^{2x+3} = (64)^{x+3}$, then find the value of 4^{2x-2} . 1
2. If $x^{51} + 51$ divides by $x + 1$, then find the remainder. 1
3. What is perpendicular distance of point P(4, 3) from y-axis? 1
4. Write the complementary angle of angle x° . 1
5. In the word 'Mathematics', what is the probability of choosing a vowel? 1
6. A match box measures 4 cm \times 2.5 cm \times 1.5 cm. What will be the volume of a packet containing 12 such boxes? 1

SECTION-B

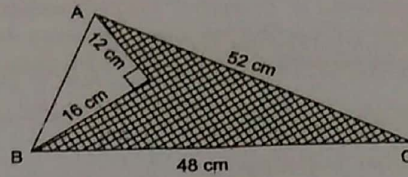
7. If $49a^2 - b = \left(7a + \frac{1}{2}\right)\left(7a - \frac{1}{2}\right)$, then find the value of b . 2
8. If angle $(2x - 10)^\circ$ and $(x - 5)^\circ$ are complementary angles, find the value of x . 2
9. AD and BE are perpendiculars of isosceles $\triangle ABC$. If $AC = BC$, then prove that $AE = BD$. 2



10. Show that opposite angles of a parallelogram are equal. 2

11. Find the area of shaded region in the given figure.

2



12. If the mean of the observations $x, 2x + 1, 2x + 5, 2x + 9$ is 30, what is the mean of last two observations?

2

SECTION-C

13. Simplify: $\left(\frac{x^a}{x^{-b}}\right)^{a-b} \times \left(\frac{x^b}{x^{-c}}\right)^{b-c} \times \left(\frac{x^c}{x^{-a}}\right)^{c-a}$

3

14. Show that if $2(a^2 + b^2) = (a + b)^2$, then $a = b$.

3

15. Plot the point $P(-6, 2)$, and from it draw PM and PN as perpendicular to x -axis and y -axis respectively. Write the coordinates of the point M and N .

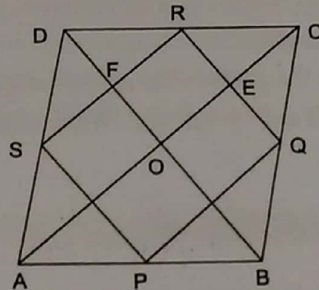
3

16. If the points $A(4, 6)$ and $B(1, 3)$ lie on the graph of $ax + by = 8$, then find the value of a and b .

3

17. Quadrilateral $ABCD$ is a rhombus and P, Q, R, S are the mid-points of AB, BC, CD and DA respectively. Prove that quadrilateral $PQRS$ is a rectangle.

3



18. Show that the diagonals of a parallelogram divide it into four triangles of equal area.

3

19. Given a quadrilateral $ABCD$ in which $AB = 3.6$ cm, $BC = 7.7$ cm, $CD = 6.8$ cm, $DA = 5.1$ cm and $AC = 8.5$ cm. Construct a triangle equal in area to this quadrilateral.

3

20. A patient in a hospital is given soup daily in a cylindrical bowl of diameter 7 cm. If the bowl is filled with soup to a height of 4 cm, how much soup the hospital has to prepared daily to serve 250 patients?

$\left[\text{Use } \pi = \frac{22}{7} \right]$

3

21. The length of a classroom is two times its height and its breadth is $\left(1\frac{1}{2}\right)$ times its height.

The cost of white-washing the walls at the rate of ₹ 1.60 per m^2 is ₹ 179.20. Find the cost of tiling the floor at the rate of ₹ 6.75 m^2 .

3

22. On the page of a telephone directory, there are 200 telephone numbers. The frequency distribution of the digit at their unit place is given below:

3

Unit digit	0	1	2	3	4	5	6	7	8	9
Frequency	22	26	22	22	20	10	14	28	16	20

Without looking at the page, a number is chosen at random from the page. What is the probability that the digit at the unit's place of the number chosen is greater than 6?

SECTION-D

23. Pallavi and Sagrika decided to donate ₹ 1600 for the earthquake victims in Prime Minister relief fund. Considering Pallavi's share as 'X' and Sagrika's share as 'Y'. 4
- (i) Form a linear equation in two variables.
- (ii) If Pallavi donates thrice the amount donated by Sagrika, then find out the amount donated by the both.
- (iii) What values of both the children are depicting here?

OR

Solve for x: $\frac{3x-5}{3} + \frac{4(x+2)}{5} = \frac{25x+7}{15}$.

24. Factorise: $(a^2 - 2a)^2 - 23(a^2 - 2a) + 120$. 4
25. If $x = \frac{\sqrt{p+q} + \sqrt{p-q}}{\sqrt{p+q} - \sqrt{p-q}}$ and $q \neq 0$, then show that $qx^2 - 2px + q = 0$. 4
26. A cylinder is within the cube touching all the vertical faces. A cone is inside the cylinder. If their heights are same with the same base, find the ratio of their volumes. 4
27. The mean of 50 observations was 250. It was detected on checking that the value of 165 was wrongly copied as 115 for computation of mean. Find the correct mean. 4

OR

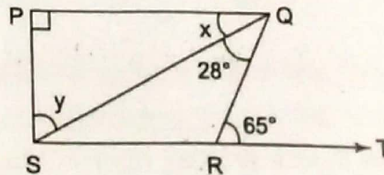
If \bar{x} is the mean of n observations $x_1, x_2, x_3 \dots x_n$, then $\sum_{i=1}^n (x_i - \bar{x}) = 0$ (or show that the algebraic sum of deviation of the set of values from arithmetic mean is zero).

28. Prove that the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle. 4
29. Prove that angles opposite to equal sides of an isosceles triangle are equal. Using this, find $\angle B$ and $\angle C$, if ABC is a right angled triangle in which $\angle A = 90^\circ$ and $AB = AC$. 4

OR

ABCD is a parallelogram. If $AB = 2AD$ and P is the mid-point of AB, then find $\angle CPD$.

30. In the given figure if $PQ \perp PS$, $PQ \parallel SR$, $\angle SQR = 28^\circ$ and $\angle QRT = 65^\circ$, then find the value of x and y. 4



OR

In the given figure, the side AB and AC of $\triangle ABC$ are produced to point E and D respectively. If bisectors BO and CO of $\angle CBE$ and $\angle BCD$ respectively meet at O, then prove that

$$\angle BOC = 90^\circ - \frac{1}{2} \angle BAC = 90^\circ - \frac{1}{2} \angle A$$

