

MATHEMATICS PAPER
CLASS IX
CBSE-2019-2020

Time allowed: 3 Hours

Max. Marks: 80

General Instructions:

- i. All the questions are compulsory.
 - ii. The questions paper consists of 30 questions divided into 4 sections A, B, C and D.
 - iii. Section A comprises 6 questions of 1 mark each. Section B comprises 6 questions of 2 marks each. Section C comprises 10 questions of 3 marks each. Section D comprises 8 questions of 4 marks each.
 - iv. There is no overall choice. However, an internal choice has been provided. You have to attempt only one of the alternatives in all such questions.
 - v. Use of calculators is not permitted.
-

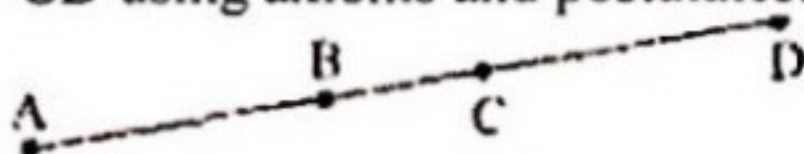
SECTION A

1. If the supplement of an angle is equal to the sum of the angle and thrice its complement, find the sum of complement and supplement of the angle.
2. If $32^x = 10$, what is $4^{(5x/2)+1}$?
3. If $x = 0$ and $y = k$ is a solution of the equation $5x - 3y = 3$, find the value of k .
4. The volume and surface area of a sphere are numerically equal. Find its radius.
5. Find the mirror image of A (5, 2) in y axis.
6. A point is such that (abscissa of the point, other than zero) that it equals to the ordinate of the point. In which quadrants can the point lie?

SECTION B

7. Find $0.\overline{6} + 0.4\overline{72}$

8. If $AC = BD$, prove that $AB = CD$ using axioms and postulates.



9. A triangle is having sides a , b and c . If $s - a = 4$ cm, $s - b = 8$ cm and $s - c = 12$ cm, then find its area.

10. Represent $\sqrt{5} + \sqrt{13}$ on number line.

11. Answer the following:

(i) If $P(E) = 0.2$, find $P(\text{not } E)$.

(ii) "Probability of an event cannot be greater than 1". Is the statement true or false?

(iii) What is the probability of a sure event?

(iv) If a coin is tossed 40 times and 19 times head appears and 21 times tail appears, write the probability of getting a head in a trial out of these 40 trials of the experiment.

12. Prove that a cyclic parallelogram is a rectangle.

SECTION C

13. Draw a line of 9cm and divide it into 4 equal parts.

14. The parallel sides of a trapezium are 77 m and 60 m. Its non parallel sides are 26 m and 25 m. Find the area of trapezium.

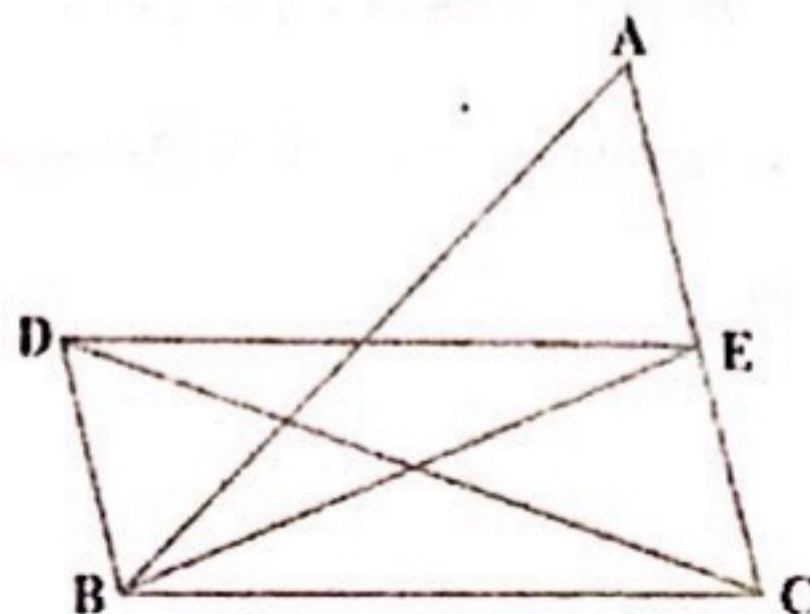
15. Factorize $x^6 + 3x^3 - 40$

16. If $9^{x-0.5} - 2^{2x-2} = 4^x - 3^{2x-3}$ and $y = x + 5$, find a definite value of y .

17. Find the value of $qx^2 - 2px + q$ if:

$$x = \frac{\sqrt{p+q} + \sqrt{p-q}}{\sqrt{p+q} - \sqrt{p-q}}$$

18. In the figure $BD \parallel CA$, E is mid-point of CA and $BD = \frac{1}{2} AC$. Prove that $\text{ar}(\Delta ABC) = 2 \text{ar}(\Delta DBC)$

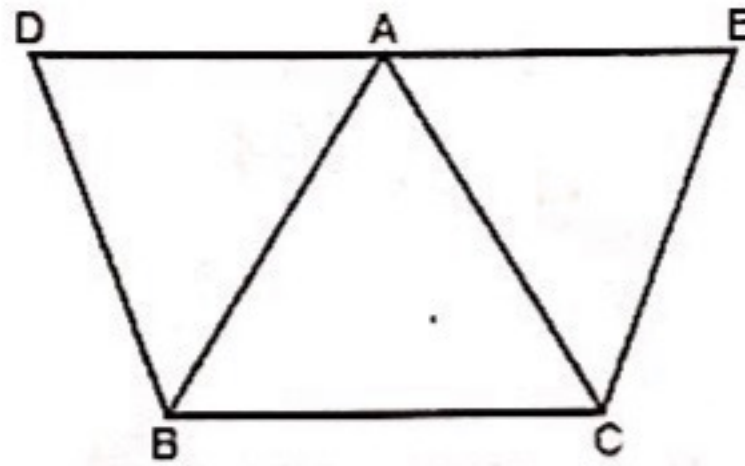


19. Do as directed:

If $t + \frac{1}{t} = 8$, then find the value of $t^3 + \frac{1}{t^3}$

20. The taxi fare in a town is Rs 10 for the first kilometer and Rs 6 per km for the subsequent distance. Taking the distance as x km and total fare as Rs. y , write a linear equation for this information and find 3 solutions for it. What will be the total fare for 15 km?

21. In the given figure, equilateral $\triangle ABD$ and $\triangle ACE$ are drawn on the sides of a $\triangle ABC$. Prove that $CD = BE$.



22. Given below is the frequency distribution of wages (in Rs.) of 30 workers in a certain factory

Wages (in Rs.)	110-130	130-150	150-170	170-190	190-210	210-230	230-250
No. of workers	3	4	5	6	5	4	3

A worker is selected at random. Find the probability that his wages are:

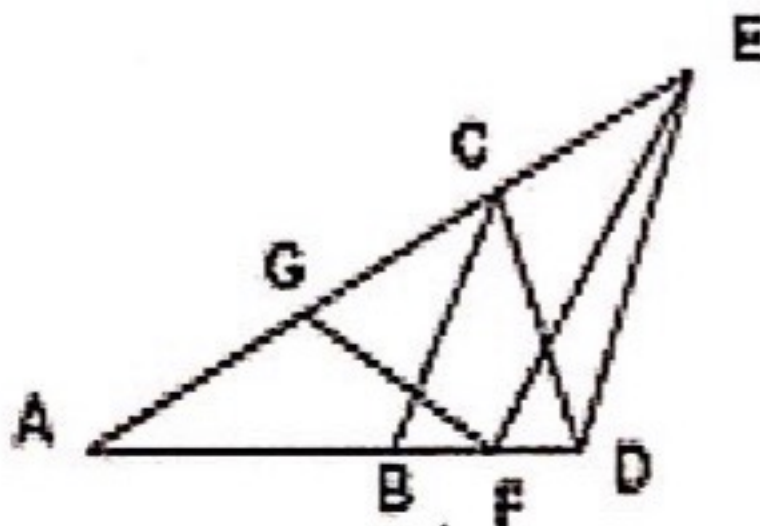
- less than Rs. 230
- at least Rs. 210
- more than or equal to 150 but less than 210.

SECTION D

23. A solid metallic cube is melted to form five solid cubes whose volumes are in the ratio 1 : 1 : 8 : 27 : 27. Find the percentage by which the sum of the surface areas of these five cubes exceeds the surface area of the original cube.

24. Factorize $x^3 - 2x^2 - (4 + 2\sqrt{3})x + 8 + 4\sqrt{3}$ as a product of 3 terms.

25. In the figure below, $AB=BC=CD=DE=EF=FG=GA$. Then find angle DAE?

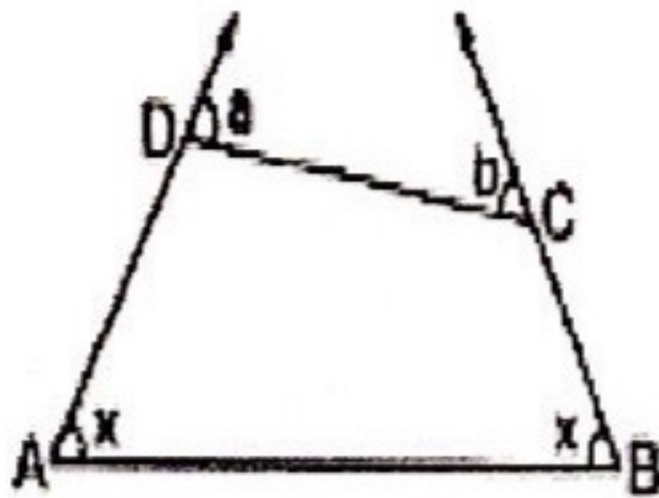


26. $A(-2,2)$, $B(8,2)$ and $C(4,-4)$ are the vertices of a parallelogram ABCD. By plotting the given points on a graph paper, find the co-ordinates of the fourth vertex D. Also from the same graph, state the co-ordinates of the mid-points of the sides AB and CD.

27. Construct a triangle XYZ in which $\angle Y = 30^\circ$, $\angle Z = 90^\circ$ and $XY + YZ + ZX = 11$ cm.

28. The sides AD and BC of a quadrilateral are produced as shown in the given figure.

Prove that $x = \frac{a+b}{2}$



29. The mean of 40 numbers was found to be 35. Later on it was detected that a number 56 was misread as 16. Find the correct mean of the given numbers.

30. A ball of diameter 4 cm is kept on top of a hollow cylinder standing vertically. The height of the cylinder is 3 cm, while its volume is 9π cm³. Then find the vertical distance, in cm, of the topmost point of the ball from the base of the cylinder.
