

**CBSE Class 9 Mathematics**  
**Sample Paper -01 (2017-18)**

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**General Instructions:**

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

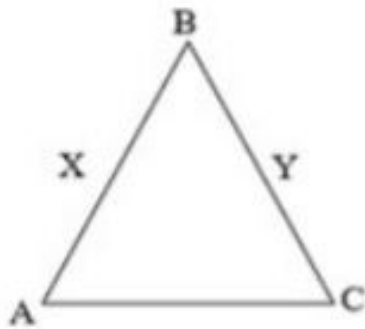
**(Question numbers 1 to 6 carry 1 mark each)**

1. If  $x^{a/b}=1$ , then find the value of 'a'.
2. If  $p(x) = 2x^3 + 5x^2 - 3x - 2$  is divided by  $x-1$ , then find the remainder.
3. The distance of the point  $(0, -1)$  from the origin is \_\_\_\_\_.
4. If the vertical angle of an isosceles triangle is  $100^\circ$ , then find the measures of its base angles.
5. The ratio of the whole surface area of a solid sphere and a solid hemisphere is \_\_\_\_.
6. There are 60 boys and 40 girls in a class. A student is selected at random. Find the probability that student is a girl.

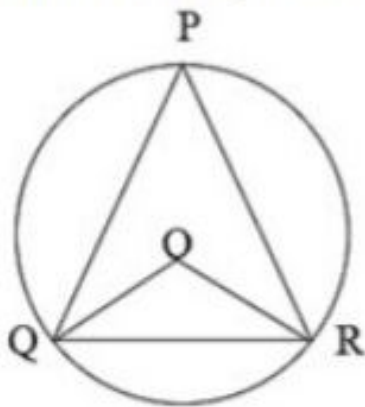
**Section B**

**(Question numbers 7 to 12 carry 2 marks each)**

7. If  $p = 2 - a$ , then prove that  $a^3 + 6ap + p^3 - 8 = 0$ .
8. In the adjoining figure, we have  $AB = BC$ ,  $BX = BY$ . Show that  $AX = CY$  (using appropriate Euclid's axiom)



9. If two opposite angles of a parallelogram are  $(63 - 3x)^\circ$  and  $(4x - 7)^\circ$ . Find all the angles of the parallelogram.
10. Three Schools situated at P, Q and R in the figure are equidistant from each other as shown in the figure. Find  $\angle QOR$ .



11. The diameter of the two right circular cones are equal if their slant heights are in the ratio 3 : 2, then what is the ratio of their curved surface areas?
12. A batsman in his 11<sup>th</sup> innings makes a score of 68 runs and there by increases his average score by 2. What is his average score after the 11<sup>th</sup> innings.

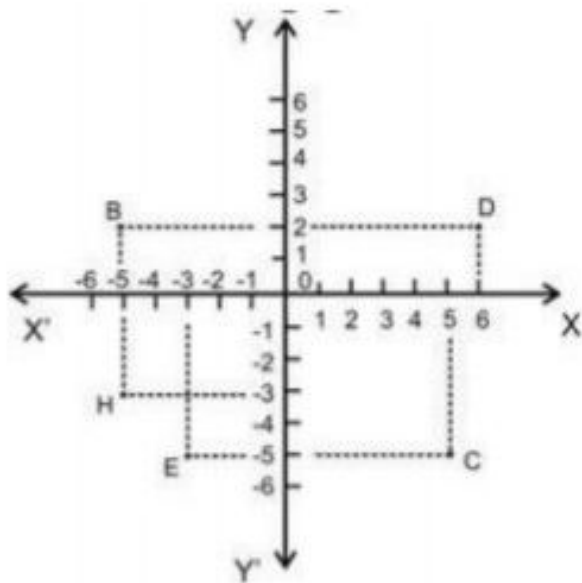
### Section C

(Question numbers 13 to 22 carry 3 marks each)

13. Represent  $\sqrt{10}$  on the number line
14. Simplify:  $\frac{73 \times 73 \times 73 + 27 \times 27 \times 27}{73 \times 73 - 73 \times 27 + 27 \times 27}$
15. Determine the point on the graph of the linear equation  $2x + 5y = 19$ , whose ordinate is  $1\frac{1}{2}$  times its abscissa.
16. Locate the points (3, 0), (-2, 3), (2, -3), (-5, 4) and (-2, -4) in Cartesian plane. Also find the quadrant in which they lie.

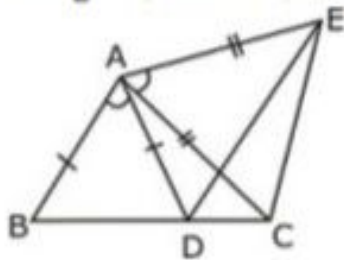
OR

Observe the fig. given below and answer the following:

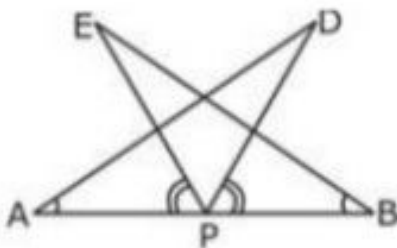


- i. The coordinates of B.
- ii. The coordinates of C.
- iii. The point identified by the coordinate (-3, -5).
- iv. The abscissa of the point D.
- v. The coordinates of H.
- vi. The coordinates of origin

17. In figure,  $AC = AE$ ,  $AB = AD$  and  $\angle BAD = \angle EAC$ . Show that  $BC = DE$ .



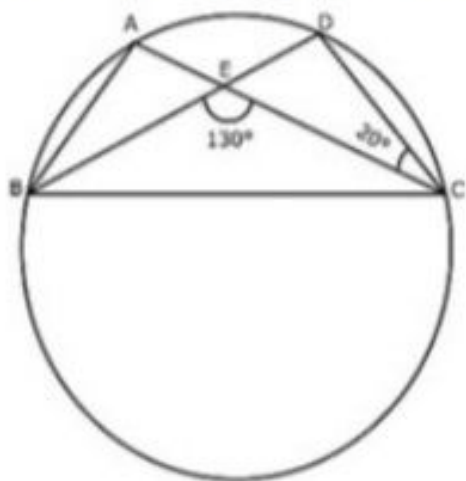
OR



AB is a line segment and P is its mid-point. D and E are points on the same side of AB such that  $\angle BAD = \angle ABE$  and  $\angle EPA = \angle DPB$ . Show that

- i.  $\triangle DAP \cong \triangle EBP$
- ii.  $AD = BE$

18. Show that the area of a rhombus is half the product of the lengths of its diagonals.
19. A, B, C and D are the four points on a circle. AC and BD intersect at point E such that  $\angle BEC = 130^\circ$  and  $\angle ECD = 20^\circ$ . Find  $\angle BAC$ .



OR

Prove that equal chords of a circle subtend equal angles at the centre.

20. Sides of a triangle are in the ratio 12 : 17 : 25 and its perimeter is 540 cm. Find its area.
21. The diameter of a garden roller is 14 m and it is 2 m long. How much area will it cover in 10 revolutions?

OR

The sum of height and radius of the base of a solid cylinder is 37cm. If the total surface area of the cylinder is  $1628 \text{ cm}^2$ , then find its volume.

22. Fifty seeds were selected at random from each 5 bags seeds and were kept under standardized conditions favorable to germination. After days, the number of seeds which had germinated in each collection were counted and recorded as follows:

Bag	1	2	3	4	5
Number of seeds generated	40	48	42	39	38

What is the probability of germination of

- (i) More than 40 seeds in a bag  
(ii) 49 seeds in a bag

(iii) More than 35 seeds in a bag

**Section D**

**(Question numbers 23 to 30 carry 4 marks each)**

23. If  $x = \frac{6 - \sqrt{32}}{2}$ , then find the value of  $\left(x^3 + \frac{1}{x^3}\right) - 6\left(x^2 + \frac{1}{x^2}\right) + \left(x + \frac{1}{x}\right)$ .

OR

If  $x = \frac{\sqrt{3}+1}{\sqrt{3}-1}$ ,  $y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$ , find the value of  $x^2 + xy - y^2$

24. Determine the value of 'b' for which the polynomial  $5x^3 - x^2 + 4x + b$  is divisible by  $1-5x$ .

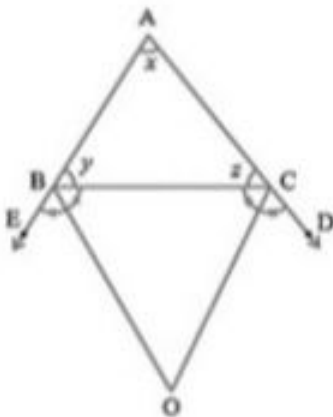
25. Draw the graph of two lines whose equations are  $x + y - 6 = 0$  and  $x - y - 2 = 0$ , on the same graph paper. Find the area of triangle formed by the two lines and y axis.

OR

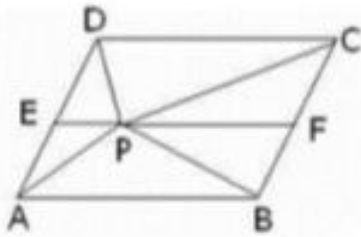
The force exerted to pull a cart is directly proportional to the acceleration produced in the cart. Express the statement as a linear equation in two variables and draw the graph for the same by taking the constant mass equal to 6 kg.

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

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



27. In the adjoining figure, P is the point in the interior of a parallelogram ABCD. Show that  $\text{ar}(\triangle APB) + \text{ar}(\triangle PCD) = \frac{1}{2} \text{ar}(\text{parallelogram ABCD})$



28. Construct a right angled triangle whose base is 5 cm and sum of its hypotenuse and other side is 8 cm.
29. The floor of a rectangular hall has a perimeter 300cm. Let the cost of painting of four walls at the rate of Rs.12 per  $\text{cm}^2$  is Rs. 24,000, then find the height of the hall.
30. The marks obtained (out of 100) by a class of 80 students are given below:

Marks	Number of students
10-20	6
20-30	17
30-50	15
50-70	16
70-100	26

Construct a histogram to represent the data above.

**OR**

Construct a frequency polygon for the following data:

Age ( in years)	Frequency
0-2	4
2-4	7
4-6	12
6-8	5
8-10	2