

PRINCE PUBLIC SCHOOL
HALF YEARLY EXAMINATION (2018-19)
SAMPLE PAPER-1
MATHEMATICS
IX

TIME ALLOWED: 3 HOURS

MAXIMUM MARKS: 80

General Instructions.

1. This question paper consists of 30 questions.
2. All questions are compulsory.
3. Question 1-6 in Section A are very short answer type questions carrying 1 mark each.
4. Question 7-12 in Section B are short answer type - I questions carrying 2 marks each.
5. Question 13-22 in Section C are short answer type-II questions carrying 3 marks each.
6. Question 23-30 in Section D are long answer type questions carrying 4 marks each.
7. There is no overall choice. However, internal choice has been provided. You have to attempt only one of the alternatives in all such questions.
8. Use of calculators is not allowed.

SECTION- A

- Q1.** Simplify $(\sqrt[3]{x^2})^4$.
- Q2.** Write the coefficient of x^2 in the expansion of $(x - 2)^3$.
- Q3.** If a point is on negative side of x-axis at a distance of 5 units from origin, then find the coordinates of the point.
- Q4.** Find the angle whose complement is equal to the angle itself.
- Q5.** Angles of a triangle are in the ratio 3 : 4 : 5. Find the largest angle of the triangle.
- Q6.** State Euclid's fifth axiom.

SECTION -B

- Q7.** Express $3.\overline{115}$ in the $\frac{p}{q}$ form, where p and q are integers and $q \neq 0$.
- Q8.** Factorise the polynomial $8x^3 - (2x - y)^3$.
- Q9.** In fig. 1, if ABC and ABD are equilateral triangles then find the coordinates of C and D .

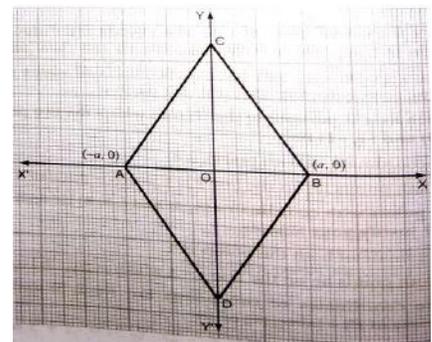


fig. 1

- Q10.** In which quadrant will the point lie, if
- a) the ordinate is 4 and the abscissa is -1 ?
 - b) the abscissa is -5 and the ordinate is -9 ?
- Q11.** Using Heron's formula, find the area of an equilateral triangle with side 12cm.

Q12. In fig. 2, $AC = XD$, C is the mid-point of AB and D is the mid-point of XY . Using a Euclid's axiom, show that $AB = XY$.

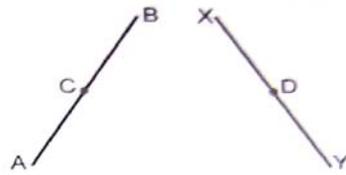


fig. 2

SECTION – C

Q13. Find the value of $\frac{4}{(216)^{\frac{-2}{3}}} + \frac{1}{(256)^{\frac{-3}{4}}} + \frac{2}{(243)^{\frac{-1}{5}}}$.

Q14. If $a = \frac{2+\sqrt{5}}{2-\sqrt{5}}$ and $b = \frac{2-\sqrt{5}}{2+\sqrt{5}}$, then find the value of $a^2 - b^2$.

Q15. Show that 2 and $-\frac{1}{3}$ are the zeros of the polynomial $3x^3 - 2x^2 - 7x - 2$. Also, find the third zero of the polynomial.

Q16. Factorise $x^2 + 3\sqrt{3}x - 30$.

Q17. From the following fig. 3, find the coordinates of the points A, B, C, D, E and F . Which of the points are mirror images in
 a) x - axis b) y - axis ?

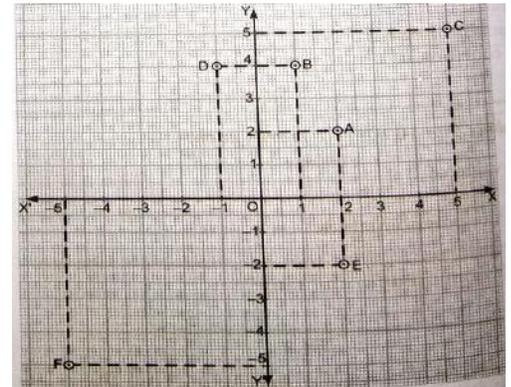


fig. 3

Q18. In a rectangular field of dimensions $60m \times 50m$, a triangular park is constructed. If the dimensions of the park is $50m, 45m$ and $35m$, find the area of the remaining field.

Q19. Find the area of a triangle whose perimeter is $180cm$ and two of its sides are $80cm$ and $18cm$. Also calculate the altitude of the triangle corresponding to the shortest side.

Q20. A teacher shows a triangular cut out XYZ to the class as shown in the fig. 4. She marked points O and P on sides XY and XZ respectively such that $OX = \frac{1}{2}XY$, $PX = \frac{1}{2}XZ$ and $OX = PX$. Show that $XY = XZ$. Mention Euclid's axiom which can be used here.

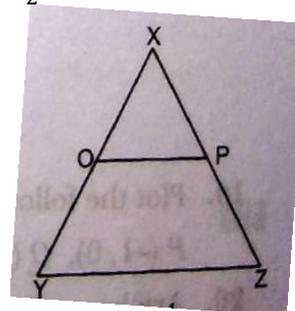


fig. 4

Q21. In fig. 5, $AB \parallel CD$. Find the value of x .

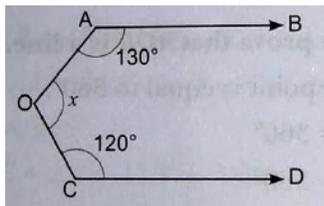


fig. 5

Q22. S is any point on side QR of a ΔPQR . Show that $PQ + QR + RP > 2PS$

SECTION- D

Q23. Rationalise $\frac{1}{\sqrt{7} + \sqrt{3} - \sqrt{2}}$.

Q24. If A and B be the remainders when the polynomial $x^3 + 2x^2 - 5ax - 7$ and $x^3 + ax^2 - 12x + 6$ are divided by $(x + 1)$ and $(x - 2)$ respectively and $2A + B = 6$, find the value of 'a'.

Q25. If $z^2 + \frac{1}{z^2} = 14$, find the value of $z^3 + \frac{1}{z^3}$.

Q26. The perimeter of a triangle is 50 cm. One side of a triangle is 4 cm longer than the smaller side and the third side is 6 cm less than twice the smaller side. Find the area of the triangle.

Q27. In fig. 6, if $PQ \perp PS$, $PQ \parallel SR$, $\angle SQR = 28^\circ$ and $\angle QRT = 65^\circ$, then find the values of x and y .

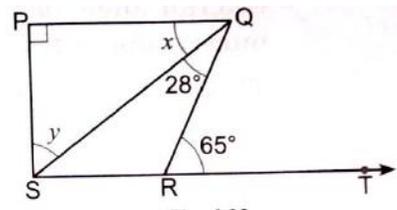


fig. 6

Q28. In fig. 7, $QT \perp PR$, $\angle TQR = 40^\circ$ and $\angle SPR = 30^\circ$. Find the value of x , y and z .

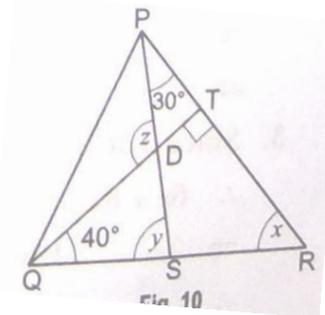


fig. 7

Q29. During Van Mahotsav, some children planted trees in a triangular region, two sides of which are 18m and 10m and the perimeter is 42m. Find the area of planted region. What value is depicted here?

Q30. In fig. 8, $\angle R > \angle Q$, PS is the bisector of $\angle QPR$ and $PT \perp RQ$. Show that $\angle TPS = \frac{1}{2}(\angle R - \angle Q)$.

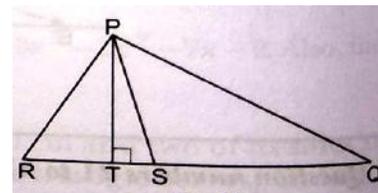


fig. 8