

St. Paul's School
Half Yearly Examination (2017-18)
Class IX
Subject: Mathematics

Time Allowed: 3 Hours

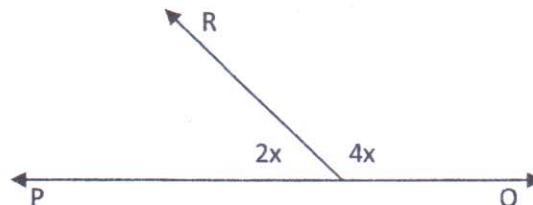
Maximum Marks : 80

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper consists of 30 questions divided into four sections – A, B, C and D.
- (iii) 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 and Section D contains 8 questions of 4 marks each.
- (iv) There is no overall choice

Section – A

1. Find two rational numbers between 3 & 4.
2. Find the remainder when $x^3 - 2x^2 + x + 1$ is divided by $(x - 1)$
3. In which quadrant does the points $(-2, 5)$ and $(3, -4)$ lie.
4. If a point C lies between two points A & B such that $AC = BC$, then prove that $AC = \frac{1}{2}AB$. Explain by drawing the figure.
5. Find x in the given figure

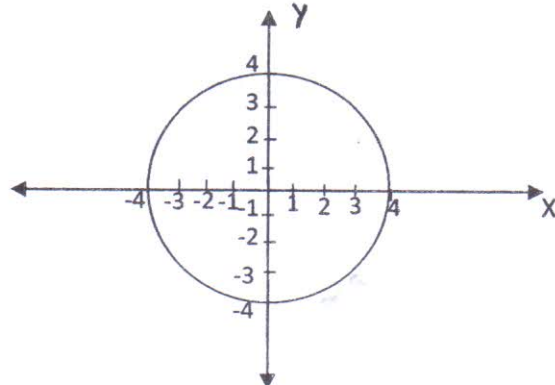


6. In $\triangle ABC$, if $AB = AC$, $\angle B = 50^\circ$, then find $\angle A$. State the property used.

Section - B

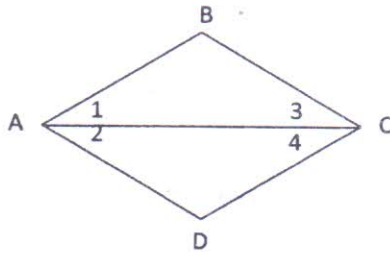
7. Express $18.\overline{48}$ in the form p/q , where p and q are integers and $q \neq 0$.
8. Show that in a right angled triangle, the hypotenuse is the longest side.
9. In the given figure, of a circle, write the co-ordinates of the points where the circle

meets the axes.



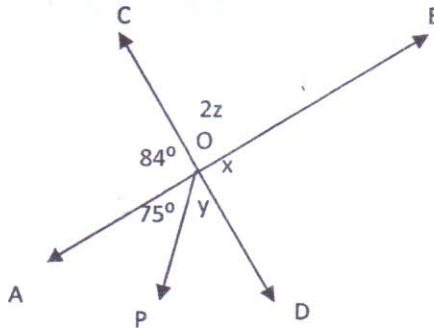
10. ✓

In the given figure, $\angle 1 = \angle 2$, $\angle 2 = \angle 3$. Show that $\angle 1 = \angle 3$ using Euclid's axiom.



11. ✓

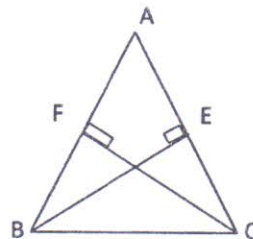
Find the value of x , y , z in the given figure if AB and CD intersect each other at O , and $\angle AOP = 75^\circ$.



12. ✓

In the given figure, ABC is a triangle in which the altitude BE and CF on sides AC and AB respectively are equal. Show that.

- a) $\triangle ABE \cong \triangle ACF$
- b) $AB = AC$



Section - C

13. Visualize $\sqrt{4.26}$ on the number line, upto 4 decimal places.

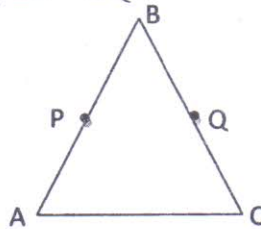
14. Verify that $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x + y + z)[(x - y)^2 + (y - z)^2 + (z - x)^2]$

15. Plot the following points and join the points in order and name the figure then obtained.

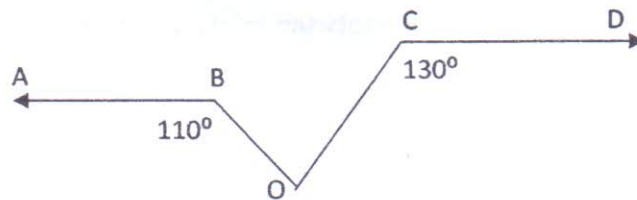
$A = (2,0)$; $B = (4,0)$; $C = (4,2)$; $D = (2,2)$

16. In the given figure, $AB = BC$, $BP = BQ$.

Show that $AP = CQ$

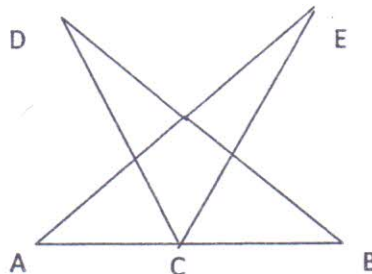


17. In the given figure $AB \parallel CD$. Determine $\angle BOC$



18. In the given figure $AC = BC$, $\angle DCA = \angle ECB$ and $\angle DBC = \angle EAC$

Prove that $DC = EC$



19. Find the value of m so that $2x - 1$ is a factor of $8x^4 + 4x^3 - 16x^2 + 10x + m$.

20. A park is in the shape of a quadrilateral ABCD in which $AB = 9m$, $BC = 12m$, $CD = 5m$, $AD = 8m$ and $\angle C = 90^\circ$. Find the area of the park.

21. Represent $\sqrt{10}$ on a number line. Also write the steps of construction.

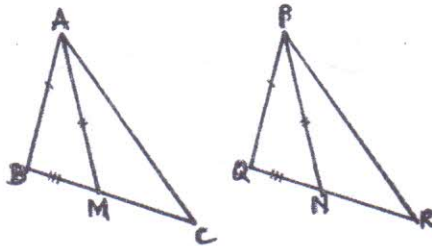
22. If the side of the triangle are in the ratio 12:17:25 and its perimeter is 540cm. Find its area.

Section - D

23. In the given figure, two sides AB and BC and the median AM of $\triangle ABC$ are equal respectively to the two sides PQ and QR and the median PN of the other $\triangle PQR$. Show that:

a) $\triangle ABM \cong \triangle PQN$

b) $\triangle ABC \cong \triangle PQR$

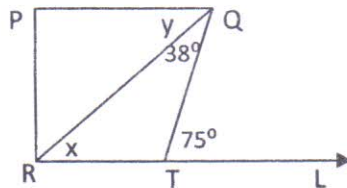


24. Factorize: $x^3 - 23x^2 + 142x - 120$

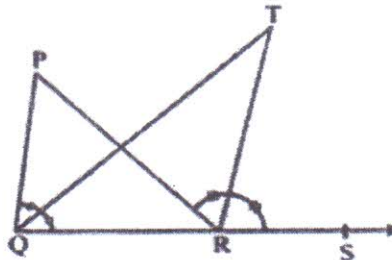
25. Locate the points in the plane if the coordinates are given as A(5,0); B(0,3); C(7,2); D(-4,3); E(-3,-2); F(3,-2); G(2.5,0) and H(-2,1.5)

26. Does Euclid's fifth postulate imply the existence of parallel lines? Explain.

27. In the given figure, $PQ \perp PR$, $PQ \parallel RL$, $\angle RQT = 38^\circ$ and $\angle QTL = 75^\circ$. Find 'x' and 'y'



28. In the given figure, the side QR of $\triangle PQR$ is produced to a point S. If the bisector of $\angle PQR$ and $\angle PRS$ meet at point T, then prove that $\angle QTR = \frac{1}{2} \angle QPR$



29. Find the value of 'a' and 'b' given that

$$\frac{\sqrt{5}-1}{\sqrt{5}+1} + \frac{\sqrt{5}+1}{\sqrt{5}-1} = a + b\sqrt{5}$$

30. A floral design on a floor is made up of 16 tiles which are triangular, the sides of the triangle being 9cm, 28cm and 35cm. Find the cost of painting the tiles at the rate of 50 paise per cm²

