

CBSE MIXED TEST PAPER-02

SELECTION TEST SETPEMEBER, 2008-09

CLASS - X MATHEMATICS

[Time: 3hrs.]

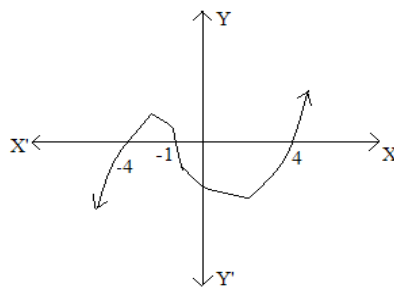
[M. M.: 80]

General Instructions:

- (1) All questions are compulsory.
- (2) The questions paper consists of 30 questions divided into 4 sections. A, B, C and D. section A comprises of 10 questions of 1 mark each, Section B comprises of 5 questions of 2 marks each, Section D comprises of 10 question of 3 marks each, and Section D comprises of 5 questions of 6 marks each.
- (3) All questions in section A are to be answered in one word, one sentence or as per the exact requirement of the question.

SECTION - A

- Q1. Write the condition to be satisfied by a q so that rational number $\frac{p}{q}$, has a terminating decimal expansion.
- Q2. Find the value of k , So that the following system of equations has no Solution.
 $3x - y - 5 = 0$
 $6x - 2y - k = 0$
- Q3. Write the roots of quadratic equations.
 $x^2 - x - 6 = 0$
- Q4. The sum and product of the zeroes of a quadratic polynomial are $-\frac{1}{4}$ and -4 respectively. What is the quadratic polynomial.
- Q5. Write the number of zeroes and also value of zeroes in the following graph.

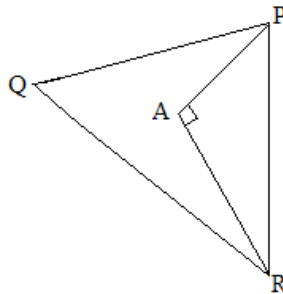


Q6. The n th term of an A.P. is $8 - 3n$. Find its common difference.

Q7. If $\tan A = \frac{3}{4}$ and $A + B = 90^\circ$, what is the value of $\cot B$?

Q8. If $\sin 3A = \cos (A - 22^\circ)$, find A , if $3A$ is an acute angle.

Q9. In fig 2, $PQ = 24\text{cm}$,
 $QR = 26\text{cm}$ $\angle PAR = 90^\circ$,
 $PA = 6\text{cm}$, and $AR = 8\text{cm}$. Find $\angle OPR$



Q10. How many tangents can be drawn from a point t to a circle, which is inside the circle?

SECTION - B

Q11. Find the zeroes of the quadratic polynomial $x^2 - 7x + 10 = 0$ and verify the relationship between the zeroes and the coefficients.

Q12. Find the discriminant of the quadratic equation $2x^2 - 4x + 3 = 0$ and hence. Find the nature of its roots.

Q13. Find the values K , for which the roots of the quadratic equation $2x^2 + Kx + 3 = 0$ are equal.

Q14. If $8\cot\theta - 7$, find the value of $\operatorname{cosec}^2\theta + \cos^2\theta$.

OR

If $\tan (A + B) = \sqrt{3}$, and $\tan (A - B) = \frac{1}{\sqrt{3}}$ A and B are acute angles. Find the value of A and B .

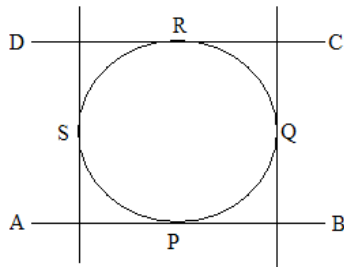
Q15. ABC is an isosceles triangle in which $AB = AC$, circumscribed about a circle. Show that BC is bisected at the point of contact.

SECTION - C

Q16. Prove that the lengths of the tangents drawn from an external point to a circle are equal.

OR

A quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$ in fig.



Q17. Prove that $3 + \sqrt{5}$ is an irrational number.

Q18. Construct a ΔABC in which $AB = 6.5\text{cm}$, $\angle B = 60^\circ$, $BC = 5.5\text{cm}$. Also construct a triangle $AB'C'$ similar to ΔABC , whose each side is $\frac{3}{2}$ times the corresponding side of ΔABC .

OR

Draw a circle with the help of a bangle. Take point outside the circle. Construct a pair of tangents from this point to the circle.

Q19. Show that $A(1, 2)$, $B(5, 4)$, $C(3, 8)$, $D(-1, 6)$ are vertices of a square.

Q20. Find the point on x-axis which is equidistant from the points $(-2, 5)$ and $(2, 3)$.

Q21. Draw the graph of the following pair of linear equations $x + 3y = 6$ and $2x - 3y = 12$. Hence find the area of the region bounded by $x = 0$, $y = 0$, $2x - 2y = 10$.

Q22. How many three digits number are divisible by 11.

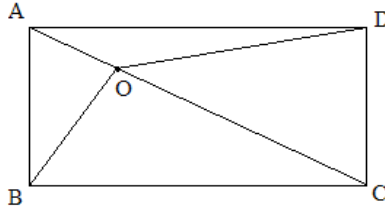
Q23. If the sum of the first n terms of an AP is $4n - n^2$, what is the 1st term and also find the n th term.

Q24. Prove that
$$\frac{\tan A - \sin A}{\tan A + \sin A} = \frac{\sec A - 1}{\sec A + 1}$$

OR

$$\frac{\sin \theta - 2 \sin^3 \theta}{2 \cos^3 \theta - \cos \theta} = \tan \theta$$

Q25. 'O' is any point inside a rectangle ABCD. Prove that $OB^2 + OD^2 = AO^2 + OC^2$. In fig (4)

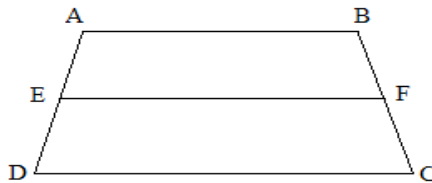


SECTION - D

- Q26. A man travels 300km. to his home partly by train and partly by bus. He takes 4 hours if he travels 60km by train and remaining by bus. If he travels 100km by train and the remaining by bus, he takes 10 minutes longer. Find the speed of the train and the bus separately.
- Q27. Places A and B are 80km. apart from each other on a highway. A car starts from point A and another starts from 'B' at the same time. If they travel in the same direction, they meet in 8 hours. And if they move in the opposite (towards each other) direction they meet in one hour and 20 minutes. Find the speeds of the car from A and B. respectively.
- Q28. Prove that ratio of the areas of two similar triangles is equal to the ratio of the squares on their corresponding sides. Using above, prove the following if the areas of the two similar triangles are equal. Prove that they are congruent.

OR

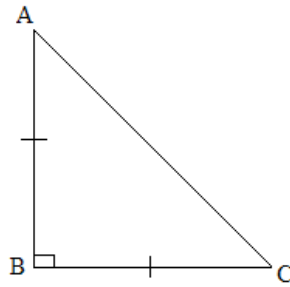
If a line is drawn parallel to one side of the triangle, the other two sides are divided in the same ratio prove it. Using above theorem.



If ABCD is a trapezium in which $AB \parallel CD \parallel EF$. Then prove that

$$\frac{AE}{ED} = \frac{BF}{FC}$$

- Q29. Prove that in a right angled triangle the square on the hypotenuse is equal to the sum of squares on other two sides by using above theorem.
 In fig (6) ΔABC is an isosceles triangle right angled at B. prove that $AC^2 = 2BC^2$.



Q30. A person standing on the bank of a river observes that the angle of elevation of the top of a tree standing on the opposite bank is 60° . When he moves 40m. away from the bank he finds the angle of elevation to be 30° .

Find the height of the tree and the width of the river.

OR

From a window 15m high above the ground in a tree, the angles of elevation and depression of the top and foot of another house on the opposite side of the street are 30° and 45° respectively. Show that the height of the opposite house is 23.66m (use $\sqrt{3} = 1.732$)