



## IIIT Bangalore – COMET Foundation

### CBSE Class X Mathematics Examination 2016

#### Delhi Set-1

#### Section A (1 Mark Each)

1. Find the polynomial whose sum and product of zeroes are  $-6$  and  $5$  respectively.
2. Find the distance of the point from its starting point if a person travels  $15$  m west and then  $8$  m north.
3. If  $PA$  and  $PB$  are tangents from an external point  $P$  to a circle with centre  $O$  and  $\angle PAB = 50^\circ$ , find  $\angle AOB$ .
4. A ladder reaches a point  $D$  on a vertical pole  $AB$  of height  $6$  m. The ladder is inclined at an angle of  $60^\circ$  with the horizontal and  $AD = 2.54$  m. Find the length of the ladder. (Use  $\sqrt{3} = 1.73$ )

#### Section B (2 Marks Each)

5. If  $-5$  is a root of the quadratic equation  $2x^2 + px - 15 = 0$ , find the value of  $p$ . Also find the value of  $k$  if  $p(x^2 + x) + k = 0$  has equal roots.
6. Find the coordinates of the points which trisect the line segment joining the points  $(2, -2)$  and  $(-7, 4)$ .
7. Prove that a parallelogram circumscribing a circle is a rhombus.
8. Find the area of a triangle whose vertices are  $A(3, 0)$ ,  $B(6, 4)$  and  $C(-1, 3)$ . Also, determine whether the triangle is isosceles right-angled.
9. If the  $4^{\text{th}}$  term of an A.P. is zero, prove that the  $25^{\text{th}}$  term of the A.P. is three times the  $11^{\text{th}}$  term.
10. If  $TP$  and  $TQ$  are tangents to a circle with centre  $O$  from an external point  $T$ , prove that  $\angle PTQ = 2\angle OPQ$ .

#### Section C (3 Marks Each)

11. In a right-angled triangle  $ABC$ , right-angled at  $A$ ,  $AB = 12$  cm and  $AC = 5$  cm. Find the area of the shaded region formed by the semicircle drawn on the hypotenuse and the triangle.

12. A hemispherical tank of diameter 3 m is full of water. It is being emptied by a pipe at the rate of  $3\frac{4}{7}$  litres/sec. How long will it take to empty half of the tank?
13. Find the sum of all three-digit natural numbers which are divisible by 7.
14. The angle of elevation of the top of a building from the foot of a tower is  $30^\circ$  and the angle of elevation of the top of the tower from the foot of the building is  $60^\circ$ . If the tower is 50 m high, find the height of the building.
15. Prove that  $bx = ay$  if the point  $P(x, y)$  is equidistant from the points  $A(a+b, b-a)$  and  $B(a-b, a+b)$ .