

## Model Question

Class - X : Mathematics (Basic) : 80 Marks : 2020-2021

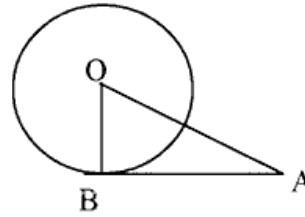
Section- A : Each Question Carries 1 Mark : 1 x 20 = 20

1) Choose the correct answer : 1x5

1. The two roots of the quadratic equation  $x^2 - 4 = 0$  are  
a) 2, 2      (b) -2, 2      (c) -2, -2      (d) 2, 0
2. In the equation  $2x - 3y = 5$  if the value of  $y$  is 3 then the value of  $x$  is  
a) -7      (b) 14      (c) 7      (d) -14
3. In the AP :  $\frac{1}{2}, \frac{1}{2}, -\frac{1}{2}, -\frac{3}{2}, \dots$  the common difference is  
a) -1      (b) 2      (c) 1      (d) 4
4. The distance of the point P (-6, 0) from the origin is  
a) 36      (b) 3      (c) 6      (d) -6
5. If the radius of a sphere is 3cm, then its volume is  
a)  $4\pi r^3 \text{ cm}^3$       (b)  $\frac{4}{3}\pi r^3 \text{ cm}^3$       (c)  $4\pi r^2 \text{ cm}^3$       (d)  $\frac{3}{4}\pi r^3 \text{ cm}^3$

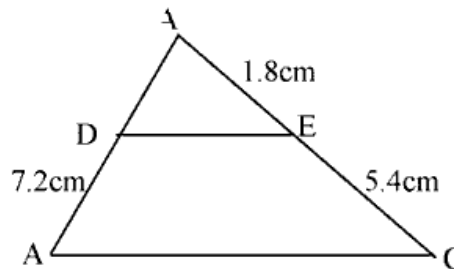
2) Answer the following questions : 1x5

1. In the given figure AB is a tangent to the circle and OB is the radius. then Find  $\angle OBA$ .



2. The value of  $\cos 60^\circ$

3. In the given figure  $DE \parallel BC$ , If  $AE=1.8 \text{ cm}$ ,  $EC = 5.4 \text{ cm}$ , and  $BD=7.2$  then  $AD=?$



4. The mid-point of the line segment joining (0,0) and (3, -6) is \_\_\_\_\_.

5. For the following frequency distribution

Class	0-5	5-10	10-15	15-20	20-25
Frequency	8	10	19	25	8

The upper limit of mode class is \_\_\_\_\_.

**II) Fill in the Blanks : 1x5**

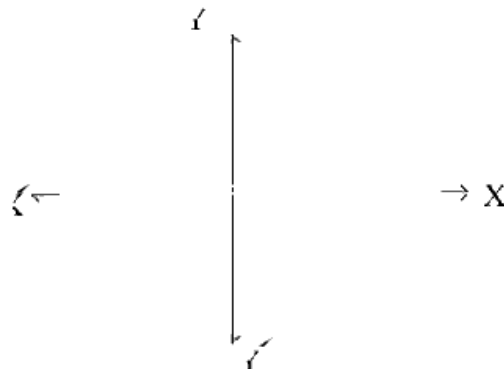
1. If 2 is a zero of the polynomial  $ax^2 - 2x$ , then the value of 'a' is \_\_\_\_\_.
2. If area of  $\Delta ABC$  is zero, then the points A, B and C are \_\_\_\_\_.

**OR**

- The distance between the point (a,b) and (-a, -b) is equal to \_\_\_\_\_.
3. If 6, x, 8 are in A.P. then x is equal to \_\_\_\_\_.
  4. Perimeter of a circle with radius r is \_\_\_\_\_.
  5. If  $\cos A = \sin 42^\circ$ , then the value of A is \_\_\_\_\_.

**V) Answer to the following questions : 1x5**

6. The graph  $y = p(x)$  is given below for the polynomial  $p(x)$ . Find the number of zeros of  $p(x)$ .



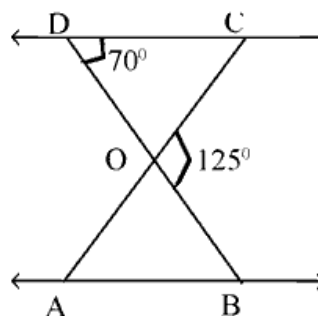
7. Express the number 140 as a product of its prime factors.
8. The radius of a cone is 3cm and height is 7cm. Find its volume.

**OR**

If the radius of a hemisphere is 2.1 cm, then find its volume.

9. In the given figure  $\Delta ODC \sim \Delta OBA$ ,  $\angle BOC = 125^\circ$  and  $\angle CDO = 70^\circ$ .

Find  $\angle OAB$ .



10. If  $P(E) = 1/3$ , What is the probability of 'not E'?

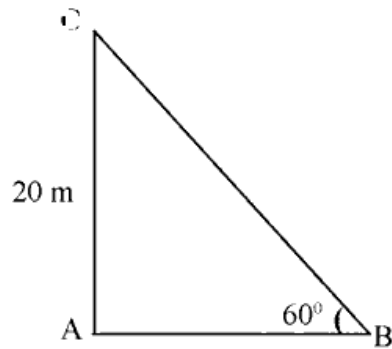
**Section- B : Each Question Carries 2 marks : 2x6=12**

11. For what value of k,  $x-3y=7$  and  $kx+6y=5$  will have no solution.
12. Find the quadratic polynomial whose sum and product of zeros are 6 and -2 respectively.

**OR**

Find the value of  $p(x) = x^2+x+1$  when  $x = -1$ .

13. In the given figure, the angle of elevation of the top of a tower AC from a point B on the ground is  $30^\circ$ . If the height of the tower is 20m, find the distance of the point from the foot of the tower.



14. A die is thrown once. Find the probability of getting (i) a prime number (ii) an odd number.

**OR**

Two coins are tossed simultaneously. What is the probability of getting (i) at least one head (ii) no head?

15. Find the L.C.M of 17, 23 and 29 .

16. If  $\tan A = \cot B$ , Prove that  $A + B = 90^\circ$ .

**Section-C : Each Question Carries 3 Marks : 3x3=24**

17. If the 3rd and the 9th terms of an AP are 4 and  $-8$  respectively, which term of this AP is zero ?

18. Find the area of the triangle whose vertices, taken in order are  $(-4, -2)$ ,  $(-3, -5)$  &  $(3, -2)$  .

19. Evaluate  $5 \cos^2 60^\circ + 4 \sec^2 30^\circ - \tan^2 45^\circ$

**OR**

If  $\cot \theta = \frac{4}{3}$  then evaluate  $\frac{(1 + \sin \theta)(1 - \sin \theta)}{(1 + \cos \theta)(1 - \cos \theta)}$  .

20. The cost of fencing a circular field at the rate of Rs. 24 per metre is Rs. 5280. The field is ploughed at the rate of Rs. 0.50 per  $m^2$ . Find the cost of ploughing the field. ( take  $\pi = \frac{22}{7}$  )

**OR**

The wheels of a car are of diameter 80 cm each. How many complete revolutions does each wheel make in 10 minutes when the car is travelling at a speed of 66 km per hour ?

21. Solve  $100x^2 - 20x + 1 = 0$

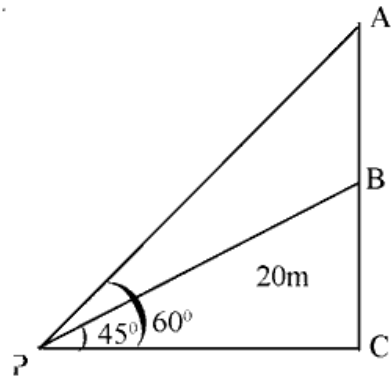
**OR**

$$x + \frac{1}{x} = 3, \quad x \neq 0$$

22. A letter is selected at random from the set of English alphabets. What is the probability that it is a vowel ?

13. Prove that  $\sqrt{3}$  is an irrational number.

14. From a point (P) on the ground, the angles of elevation of the bottom (B) and the top (A) of a transmission tower fixed at the top of a 20m high building (BC) are  $45^\circ$  and  $60^\circ$  respectively. Find the height of the tower.



**Section-D : Each Question Carries 4 Marks : 4x6=24**

15. Solve :  $3x + 4y = 10$

$$x - 2y = 3$$

**OR**

$$\frac{x}{2} - \frac{3}{y} = 2$$

$$\frac{x}{3} - \frac{4}{y} = 3$$

16. Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

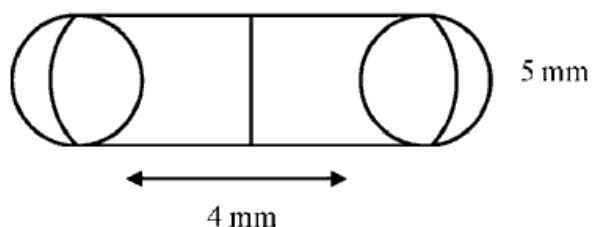
17. Draw a circle of radius 6cm. From a point 10 cm away from its centre, construct the pair of tangents to the circle. (Write only the constructional procedure but no proof in to be given. Traces of construction must be clear).

18. Prove that the lengths of tangents drawn from an external point to a circle are equal and they subtend equal angles at the centre.

**OR**

Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line-segment joining the points of contact at the centre.

9. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends (see figure). The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.



10. Find the median for the following frequency distribution :

Height (in cm)	160–162	163–165	166–168	169–171	172–174
Frequency	15	117	136	118	14

OR

The mean of the following distribution is 62.8. Find the value of  $x$ .

Class	Frequency
0–20	5
20–40	8
40–60	$x$
60–80	12
80–100	7
100–120	8

Additional Questions