EDUDEVS

Upskilling Education

CLASS - X
MATHEMATICS - BASIC
SET A

Section A

Multiple Choice Questions (Q 1 to 20)

1 Mark Each

1. The maximum number of zeroes a cubic polynomial can have, is

   (a) 1 (b) 4

   (c) 2 (d) 3

2. The roots of the quadratic equation $x^2 - 0.04 = 0$ are

   (a) ± 0.2 (b) ± 0.02

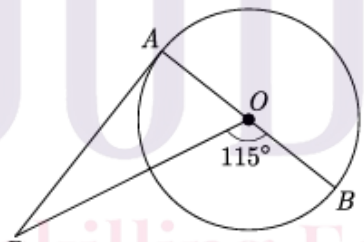
   (c) 0.4 (d) 2

3. If triangle ABC is similar to triangle DEF such that $2AB = DE$ and BC = 8 cm then find EF

   (a) 16 cm (b) 14 cm

   (c) 12 cm (d) 15 cm

4. In the given figure, PA is a tangent from an external point P to a circle with centre O. If $\angle POB = 115°$, then perimeter of $\angle APO$ is



   (a) 25° (b) 20°

   (c) 30° (d) 65°

5. If cos9α = sin α and 9 α < 90° α c, then the value of tan5 α is

   (a) $\frac{1}{\sqrt{3}}$ (b) $\sqrt{3}$

   (c) 1 (d) 0

6. From the top of a 7 m high building the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°, then the height of the tower is

(a) 14.124 m **(b) 17.124 m**

(c) 19.124 m **(d) 15.124 m**

7. A circus artist is climbing a 20 m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground. If the angle made by the rope with the ground level is 30°, then what is the height of pole?

(a) 20 m **(b) 8 m**

(c) 10 m **(d) 6 m**

8. A sphere is melted and half of the melted liquid is used to form 11 identical cubes, whereas the remaining half is used to form 7 identical smaller spheres. The ratio of the side of the cube to the radius of the new small sphere is

(a) $\left(\frac{4}{3}\right)^{1/3}$ **(b)** $\left(\frac{8}{3}\right)^{1/3}$

(c) $(3)^{1/3}$ **(d) 2**

9. Ratio of volumes of two cones with same radii is

(a) $h_1 : h_2$ (b) $s_1 : s_2$

(c) $r_1 : r_2$ (d) None of these

10. In the formula $\bar{x} = a + h\left(\frac{\sum f_i u_i}{\sum f_i}\right)$, for finding the mean of grouped frequency distribution, u_i is equal to

(a) $\frac{x_i + a}{h}$ (b) $h(x_i - a)$

(c) $\frac{x_i - a}{h}$ (d) $\frac{a - x_i}{h}$

11. Consider the following distribution :

Marks obtained	Number of students
More than or equal to 0	63
More than or equal to 10	58
More than or equal to 20	55
More than or equal to 30	51
More than or equal to 40	48
More than or equal to 50	42

the frequency of the class 30-40 is :

(a) 3 **(b) 4**

(c) 48 **(d) 51**

12. If the probability of an event is p, then the probability of its complementary event will be

(a) p - 1 **(b) p**

(c) 1 - p **(d)** $1-\frac{1}{p}$

13. A bag contains 3 red and 2 blue marbles. If a marble is drawn at random, then the probability of drawing a blue marble is:

(a) $\frac{2}{5}$ (b) $\frac{1}{4}$

(c) $\frac{3}{5}$ (d) $\frac{2}{3}$

14. The distance of the point P(- 3,- 4) from the x-axis (in units) is

(a) 3 **(b) 3**

(c) 4 **(d) 5**

15. 225 can be expressed as

(a) 5×3^2 (b) $5^2 \times 3$

(c) $5^2 \times 3^2$ (d) $5^3 \times 3$

16. If α and β are the zeroes of the polynomial x^2+2x+1, then $\frac{1}{\alpha}+\frac{1}{\beta}$ is equal to

(a) - 2 **(b) 2**

(c) 0 **(d) 1**

17.The mean weight of 9 students is 25 kg. If one more student is joined in the group the mean is unaltered, then the weight of the 10th student is

(a) 25 kg

(b) 24 kg

(c) 26 kg

(d) 23 kg

18.The radius of a circle whose circumference is equal to the sum of the circumferences of the two circles of diameters cm 36 cm and 20 cm is

(a) 56 cm

(b) 42 cm

(c) 28 cm

(d)16 cm

19.Assertion : Sum of first 10 terms of the arithmetic progression - 0.5, -1.0, - 1.5, ... is 31.

Reason : Sum of n terms of an AP is given as $S_n=\frac{n}{2}[2a+(n-1)d]$ where a is first term and d common difference.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

20.Assertion : When a positive integer a is divided by 3, the values of remainder can be 0, 1 or 2.

Reason : According to Euclid's Division Lemma a= bq + r, where $0 \leq r < b$ and r is an integer.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

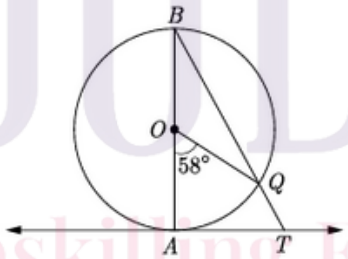
SECTION-B

2 Mark Each

21. ABCD is a trapezium in which || AB CD and its diagonals intersect each other at the point O . Show that

$$\frac{AO}{BO} = \frac{CO}{DO}.$$

22. In given figure, AB is the diameter of a circle with centre O and AT is a tangent. If ∠AOQ = 58° , find ∠ATQ .



23. Find the value of cos2θ , if 2 Sin 2 θ =√3 .

24. Find the mean of the following distribution

Class	10-25	25-40	40-55	55-70	70-85	85-100
Frequency	2	3	7	6	6	6

or

Find the mean of the following data :

Class	0- 20	20-40	40-60	60-80	80-100	100- 120
Frequency	20	35	52	44	38	31

25. Show that 5 √6 is an irrational number.

or

Write a rational number between √2 and √3.

SECTION-C

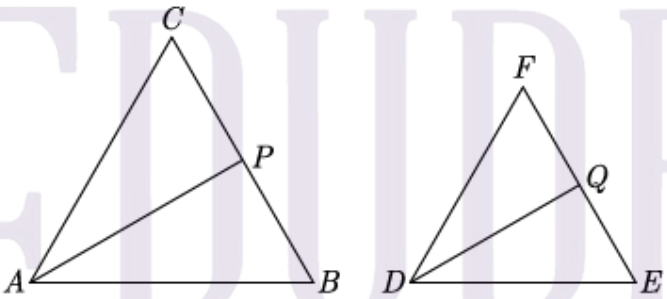
Section C consists of 6 questions of 3 marks each.

26. Quadratic polynomial $2x^2$ -3x + 1 has zeroes as α and β . Now form a quadratic polynomial whose zeroes are 3α and 3β .

27. Find whether the following pair of linear equations has a unique solutions. If yes, find the solution :

$$7x - 4y = 49 \text{ , } 5x - 6y = 57$$

28. In given figure △ ABC ~ △ DEF . AP bisects ∠CAB and DQ bisects ∠FDE .



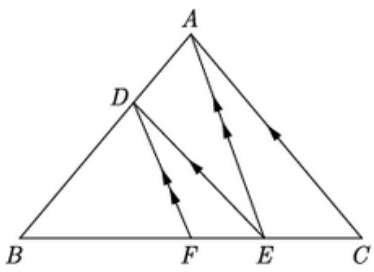
Prove that :

(1) $\frac{AP}{DQ} = \frac{AB}{DE}$

(2) △ CAP~△ FDQ

or

In the given figure, DE || AC and DF || AE Prove that $\frac{BE}{FE} = \frac{BE}{EC}$.



29. If cos (40° + x) = sin 30°, find the value of x.

30. A conical vessel, with base radius 5 cm height 24 cm, is full of water. This water emptied into a cylindrical vessel, of base radius 10 cm. Find the height to which the water will rise in the cylindrical vessel. Use $\pi = \frac{22}{7}$

31. Three bells toll at intervals of 9, 12, 15 minutes respectively. If they start tolling together, after what time will they next toll together?

SECTION-D

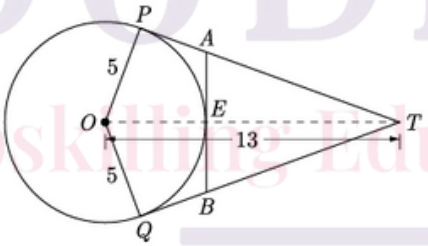
Section D consists of 4 questions of 5 marks each.

32. Find for x : $\frac{1}{x-2} + \frac{2}{x-1} = \frac{6}{x}; \quad x \neq 0, 1, 2$

or

Find the values of k for which the equation $(3k+1)x^2 + 2(k+1)x + 1$ has equal roots. Also find the roots.

33. In figure O is the centre of a circle of radius 5 cm. T is a point such that OT = 13 cm and OT intersects circle at E. If AB is a tangent to the circle at E, find the length of AB, where TP and TQ are two tangents to the circle.



34. Find the mode of the following frequency distribution

Class Interval	25-30	30-35	35-40	40-45	45-50	50-55
Frequency	25	34	50	42	38	14

or

On the sports day of a school, 300 students participated. Their ages are given in the following distribution :

Age (in years)	5-7	7-9	9-11	11-13	13-15	15-17	17-19
Number of students	67	33	41	95	36	13	15

Find the mean and mode of the data.

35. Find the ratio in which the line x - 3y = 0 divides the line segment joining the points (-2, -5) and (6 , 3). Find the coordinates of the point of intersection.