Sample Paper 18

Class - 10th Exam - 2026 - 27

Mathematics - Basic

Time : 3 Hours **Max. Marks : 80**

General Instructions :

1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion - Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 36-38 are case study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 2 Question of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = \frac{22}{7}$ wherever required if not stated.
11. Use of calculators is not allowed.

SECTION - A

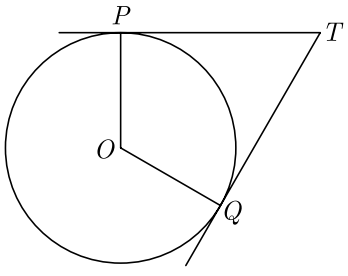
Section A consists of 20 questions of 1 mark each.

1. The diameter of a sphere is 6 cm. It is melted and drawn into a wire of diameter 2 mm. The length of the wire is

(a) 12 m (b) 18 m

(c) 36 m (d) 66 m

2. In the adjoining figure, TP and TQ are the two tangents to a circle with centre O. If $\angle POQ = 110^\circ$, then $\angle PTQ$ is



(a) 60° (b) 70°

(c) 80° (d) 90°

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3. $2\sqrt{3}$ is

(a) an integer (b) a rational number

(c) an irrational number (d) a whole number

4. If $A(\frac{m}{3}, 5)$ is the mid-point of the line segment joining the points $Q(-6, 7)$ and $R(-2, 3)$, then the value of m is

(a) -12 (b) -4

(c) 12 (d) -6

5. The quadratic polynomial, the sum of whose zeroes is -5 and their product is 6, is

(a) x^2+5x+6 (b) x^2-5x+6

(c) x^2-5x-6 (d) $-x^2+5x+6$

6. The base radii of a cone and a cylinder are equal. If their curved surface areas are also equal, then the ratio of the slant height of the cone to the height of the cylinder is

(a) 2 : 1 (b) 1 : 2

(c) 1 : 3 (d) 3 : 1

7. A single letter is selected at random from the word PROBABILITY. The probability that the selected letter is a vowel is

(a) $\frac{2}{11}$ (b) $\frac{3}{11}$

(c) $\frac{4}{11}$ (d) 0

8. The probability expressed as a percentage of a particular occurrence can never be

(a) Less than 100 (b) Less than 0

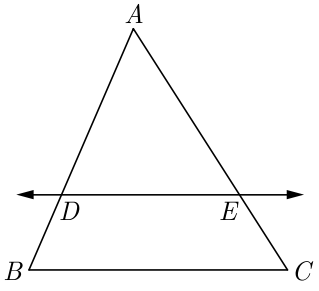
(c) Greater than 1 (d) Anything but a whole number

9. The value of k for which the system of linear equations $x+2y=3$, $5x+ky+7=0$ is inconsistent is

(a) $-\frac{14}{3}$ (b) $\frac{2}{5}$

(c) 5 (d) 10

10. In Figure, in ΔABC, $DE \parallel BC$ such that $AD = 2.4$ cm, $AB = 3.2$ cm and $AC = 8$ cm, then what is the length of AE?



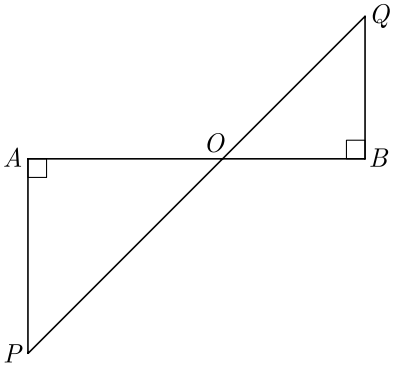
(a) 4 cm (b) 6 cm
(c) 8 cm (d) 3 cm

11. 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 10^{th} student is
(a) 25 kg (b) 24 kg
(c) 26 kg (d) 23 kg

12. The quadratic equation $2x^2 - \sqrt{5}\,x + 1 = 0$ has
(a) Two distinct real roots (b) Two equal real roots
(c) No real roots (d) More than 2 real roots

13. The first four terms of an AP whose first term is -2 and the common difference is -2 are
(a) $-2, 0, 2, 4$ (b) $-2, 4, -8, 16$
(c) $-2, -4, -6, -8$ (d) $-2, -4, -8, -16$

14. In the given figure, if $\angle A = 90^0, \angle B = 90^0$, $OB = 4.5$cm $OA = 6$ cm and $AP = 4$ cm then find QB.



(a) 3 cm (b) 6 cm
(c) 4.5 cm (d) 3.5 cm

15. For the following distribution.

Class	0-5	5-10	10-15	15-20	20-25
Frequency	10	15	12	20	9

The sum of lower limits of the median class and modal class is
(a) 15 (b) 25
(c) 30 (d) 35

16. If ΔABC is right angled at C, then the value of$\cos(A + B)$ is
(a) 0 (b) 1
(c) $\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$

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17. A pole casts a shadow of length $2\sqrt{3}$ m on the ground, when the Sun's elevation is 60°. Find the height of the pole.

(a) 4 m (b) 6 m

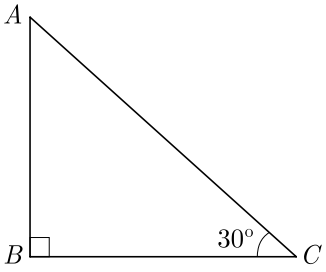
(c) 2 m (d) 3 m

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

(a) 56 cm (b) 42 cm

(c) 28 cm (d) 16 cm

19. **Assertion :** In the figure, if $BC = 20$ m, then height AB is 11.56 m.



Reason : $\tan\theta = \frac{AB}{BC} = \frac{\text{perpendicular}}{\text{base}}$ where θ is the angle $\angle ACB$.

(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 :** If both zeros of the quadratic polynomial $x^2 - 2kx + 2$ are equal in magnitude but opposite in sign then value of k is ½.

Reason : Sum of zeros of a quadratic polynomial $ax^2 + bx + c$ is $\frac{-b}{a}$

(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.

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SECTION - B

Section B consists of 5 questions of 2 marks each.

21. A bag contains cards bearing numbers from 11 to 30. A card is taken out from the bag at random. Find the probability that the selected card has multiple of 5 on it.

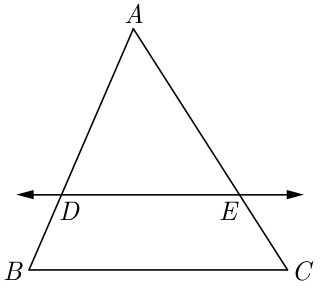
22. Form a quadratic polynomial $p(x)$ with 3 and $-\frac{2}{5}$ as sum and product of its zeroes, respectively.

OR

If α and β are the zeroes of the polynomial $f(x) = 5x^2 - 7x + 1$ then find the value of $\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right)$.

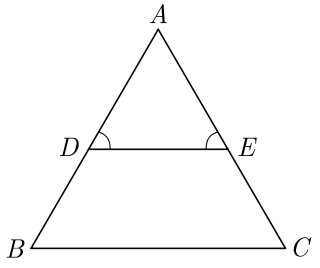
23. If $A(\frac{m}{3}, 5)$ is the mid-point of the line segment joining the points $Q(-6, 7)$ and $R(-2, 3)$, then what is the value of m ?

24. In Figure, in ΔABC, $DE \parallel BC$ such that $AD = 2.4$ cm, $AB = 3.2$ cm and $AC = 8$ cm, then what is the length of AE?



OR

In Figure $\angle D = \angle E$ and $\frac{AD}{DB} = \frac{AE}{EC}$,prove that ΔBAC is an isosceles triangle.



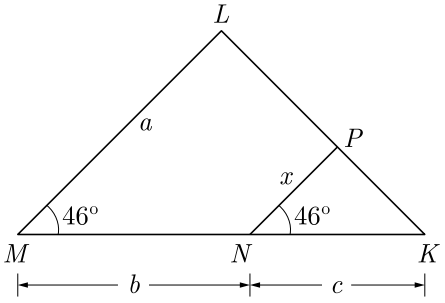
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25. Explain whether $3 \times 12 \times 101 + 4$ is a prime number or a composite number.

SECTION - C

Section C consists of 6 questions of 3 marks each.

26. What is the value of x in given figure?



27. Evaluate : $\frac{\cos 45^o}{\sec 30^o} + \frac{1}{\sec 60^o}$

28. An isosceles triangle ABC, with $AB = AC$, circumscribes a circle, touching BC at P, AC at Q and AB at R. Prove that the contact point P bisects BC.

29. A glass is in the shape of a cylinder of radius 7 cm and height 10 cm. Find the volume of juice in litre required to fill 6 such glasses. Use $\pi = \frac{22}{7}$

OR

The volume of a right circular cylinder with its height equal to the radius is $25\frac{1}{7}$ cm^3. Find the height of the cylinder. (Use $\pi = \frac{22}{7}$)

30. Given that $\sqrt{2}$ is irrational, prove that $(5 + 3\sqrt{2})$ is an irrational number.

31. Find the mode of the following frequency distribution:

Class	15-20	20-25	25-30	30-35	35-40	40-45
Frequency	3	8	9	10	3	2

OR

The marks obtained by 110 students in an examination are given below

Marks	30-35	35-40	40-45	45-50	50-55	55-60	60-65
Number of Students	14	16	28	23	18	8	3

Find the mean marks of the students.

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SECTION - D

Section D consists of 4 questions of 5 marks each.

32. Four equal circles are described at the four corners of a square so that each touches two of the others. The shaded area enclosed between the circle is $\frac{24}{7}$ cm^2. Find the radius of each circle.

33. Write all the values of p for which the quadratic equation $x^2+px+16=0$ has equal roots. Find the roots of the equation so obtained.

OR

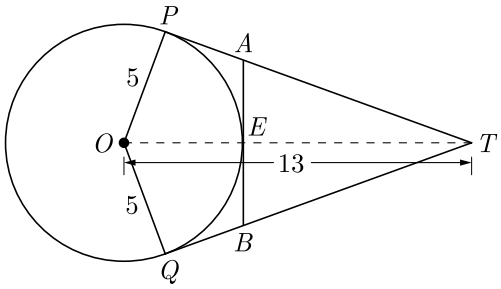
In a flight of 600 km, an aircraft was slowed down due to bad weather. The average speed of the trip was reduced by 200 km/hr and the time of flight increased by 30 minutes. Find the duration of flight.

34. If the point $P(x,y)$ is equidistant from the points $Q(a+b,b-a)$ and $R(a-b,a+b)$, then prove that $bx=ay$.

35. a,b and c are the sides of a right triangle, where c is the hypotenuse. A circle, of radius r, touches the sides of the triangle. Prove that $r=\dfrac{a+b-c}{2}$.

OR

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.



SECTION - E

Section E consists of 3 case study based questions of 4 marks each.

36. Arc of a Baby Swing : When Mackenzie's baby swing is started, the first swing (one way) is a 30 inch arc. As the swing slows down, each successive arc is 1.5 inch less than the previous one.

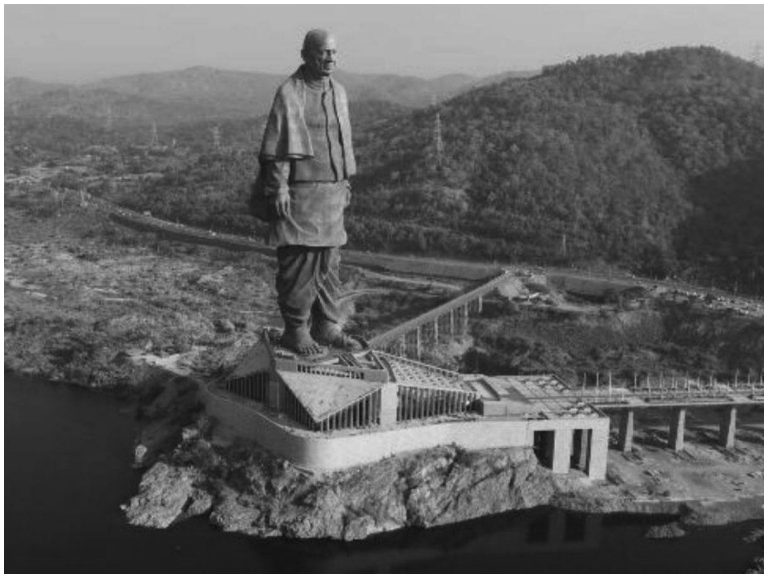
(i) Find the length of the tenth swing.

(ii) How far Mackenzie has travelled during the 10 swings ?

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37. Statue of Unity : It is a colossal statue of Indian statesman and independence activist Sardar Vallabh bhai Patel, who was the first Deputy Prime Minister and Home minister of independent India.



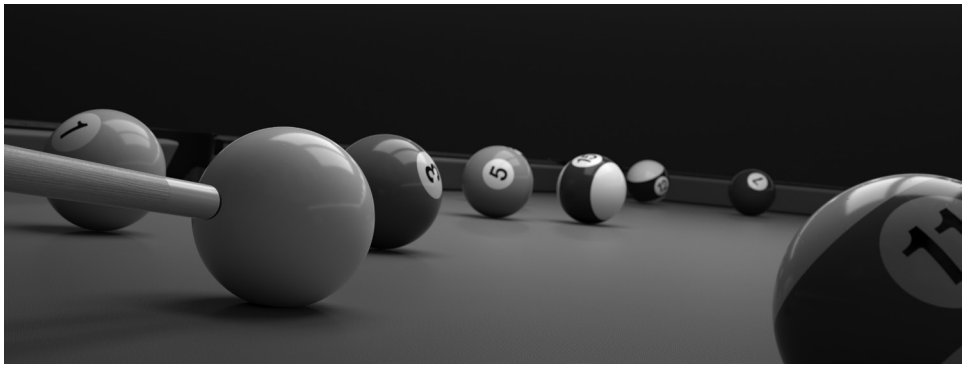
Patel was highly respected for his leadership in uniting the 562 princely states of India to form the single Union of India. It is located in the state of Gujarat and it is the world's tallest statue.

(i) For a person standing 240 m from the center of the base of the statue, the angle of elevation to the top of the statue is 45°. How tall is the statue?

(ii) A cop in helicopter near the top of the statue, notices a car wreck some distance from the statue. If the angle of depression from the cop's eyes to the wreck is 60°, how far away is the accident from the centre of base of the statue?

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38. Eight Ball : This is a game played on a pool table with 15 balls numbered 1 through 15 and a cue ball that is solid white. Of the 15 numbered balls, 8 are a solid (nonwhite) color and numbered 1 through 8, and seven are striped balls numbered 9 through 15.



The fifteen numbered pool balls (no cueball) are placed in a large bowl and mixed, then one is drawn out.

(i) What is the probability of drawing the eight ball ?

(ii) What is the probability of drawing a number greater than fifteen ?

(iii) What is the probability of drawing an even number ?

(iv) What is the probability of drawing a multiple of three ?

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