Sample Paper 1

Class- X Exam - 2022-23

Mathematics - Standard

Time Allowed: 3 Hours **Maximum Marks : 80**

General Instructions :

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.

SECTION-A

Section A consists of 20 questions of 1 mark each.

1. If the sum of the zeroes of the quadratic polynomial $kx^2 + 2x + 3k$ is equal to their product, then k equals

View Solution

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

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

2. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is

View Solution

(a) 10 (b) -10

(c) -7 (d) -2

3. The 2 digit number which becomes $\frac{5}{6}$th of itself when its digits are reversed. The difference in the digits of the number being 1, then the two digits number is

View Solution

(a) 45 (b) 54

(c) 36 (d) None of these

4. For which value(s) of p, will the lines represented by the following pair of linear equations be parallel

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$$3x - y - 5 = 0$$

$$6x - 2y - p = 0$$

(a) all real values except 10

(b) 10

(c) 5/2

(d) 1/2

5. Each root of $x^2 - bx + c = 0$ is decreased by 2. The resulting equation is $x^2 - 2x + 1 = 0$, then

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(a) $b = 6, c = 9$ (b) $b = 3, c = 5$

(c) $b = 2, c = -1$ (d) $b = -4, c = 3$

6. $(x^2+1)^2 - x^2 = 0$ has

View Solution

(a) four real roots

(b) two real roots

(c) no real roots

(d) one real root

7. The nth term of the AP a, $3a$, $5a$, ... is

View Solution

(a) na (b) $(2n-1)\,a$

(c) $(2n+1)\,a$ (d) $2na$

8. In an AP, if $a = 3.5$, $d = 0$ and $n = 101$, then a_n will be

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(a) 0 (b) 3.5

(c) 103.5 (d) 104.5

9. In the given figure, $DE \parallel BC$. The value of EC is

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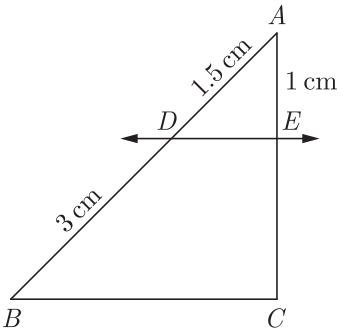

(a) 1.5 cm (b) 3 cm

(c) 2 cm (d) 1 cm

10. In figure, on a circle of radius 7 cm, tangent PT is drawn from a point P such that $PT = 24$ cm. If O is the centre of the circle, then the length of PR is

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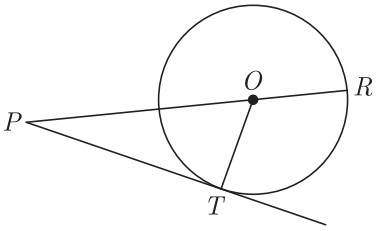


(a) 30 cm (b) 28 cm

(c) 32 cm (d) 25 cm

11. The value of the expression
View Solution $\operatorname{cosec}(75^\circ+\theta)-\sec(15^\circ-\theta)-\tan(55^\circ+\theta)+\cot(35^\circ-\theta)$ is

(a) -1 (b) 0

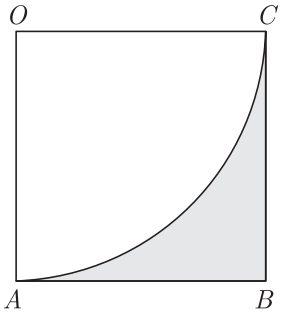
(c) 1 (d) $\frac{3}{2}$

12. If the angle of depression of an object from a 75 m high tower is 30°, then the distance of the object from the
View Solution tower is

(a) $25\sqrt{3}$ m (b) $50\sqrt{3}$ m

(c) $75\sqrt{3}$ m (d) 150 m

13. In the adjoining figure, $OABC$ is a square of side 7 cm. OAC is a quadrant of a circle with O as centre. The area
View Solution of the shaded region is



(a) $10.5\ \text{cm}^2$ (b) $38.5\ \text{cm}^2$

(c) $49\ \text{cm}^2$ (d) $11.5\ \text{cm}^2$

14. If the radius of the sphere is increased by 100%, the volume of the corresponding sphere is increased by
View Solution (a) 200%

(b) 500%

(c) 700%

(d) 800%

15. The median and mode respectively of a frequency distribution are 26 and 29, Then its mean is
View Solution (a) 27.5 (b) 24.5

(c) 28.4 (d) 25.8

16. An event is very unlikely to happen. Its probability is closest to
View Solution (a) 0.0001

(b) 0.001

(c) 0.01

(d) 0.1

17. The centroid of the triangle whose vertices are $(3,-7),(-8,6)$ and (5, 10) is
View Solution (a) (0, 9) (b) (0, 3)

(c) (1, 3) (d) (3, 5)

18. If the distance between the points $A(4, p)$ and $B(1, 0)$ is 5 units then the value(s) of p is(are)

View Solution

(a) 4 only
(b) -4 only
(c) ± 4
(d) 0

In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correction option.

19. **Assertion :** The value of y is 6, for which the distance between the points $P(2, -3)$ and $Q(10, y)$ is 10.

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Reason : Distance between two given points $A(x_1, y_1)$ *and* $B(x_2, y_2)$ is given,

$$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

(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 :** $\frac{13}{3125}$ is a terminating decimal fraction.

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Reason : If $q = 2^m 5^n$ where m, n are non-negative integers, then $\frac{p}{q}$ is a terminating decimal fraction.

(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

Section B consists of 5 questions of 2 marks each.

21. In $\Delta ABC, AD \perp BC$, such that $AD^2 = BD \times CD$. Prove that ΔABC is right angled at A.

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22. In figure, a circle touches all the four sides of a quadrilateral $ABCD$. If $AB = 6$ cm, $BC = 9$ cm and $CD = 8$ cm, then find the length of AD.

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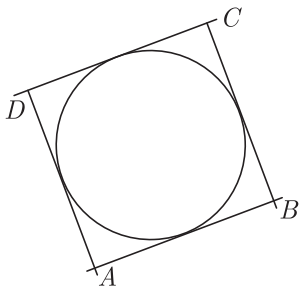

23. If $\tan 2A = \cot(A - 18^\circ)$, where $2A$ is an acute angle, find the value of A.

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24. Find the mean the following distribution :

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Class	3-5	5-7	7-9	9-11	11-13
Frequency	5	10	10	7	8

OR

Find the mode of the following data :

Class :	0-20	20-40	40-60	60-80	80-100	100-120	120-140
Frequency	6	8	10	12	6	5	3

25. Explain why $(7 \times 13 \times 11) + 11$ and $(7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1) + 3$ are composite numbers.

View Solution

OR

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. The sum of four consecutive number in AP is 32 and the ratio of the product of the first and last term to the product of two middle terms is 7 : 15. Find the numbers.

View Solution

27. Prove that : $\frac{\cot\theta + \operatorname{cosec}\theta - 1}{\cot\theta - \operatorname{cosec}\theta + 1} = \frac{1 + \cot\theta}{\sin\theta}$

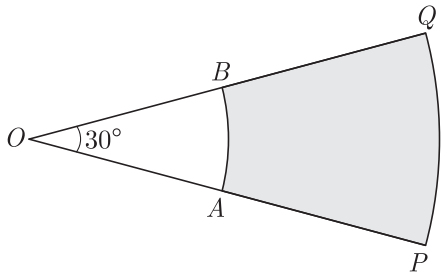
View Solution

28. A road which is 7 m wide surrounds a circular park whose circumference is 88 m. Find the area of the road.

View Solution

OR

In Figure, PQ and AB are two arcs of concentric circles of radii 7 cm and 3.5 cm respectively, with centre O. If $\angle POQ = 30^\circ$, then find the area of shaded region.



29. Compute the mode for the following frequency distribution:

View Solution

Size of items (in cm)	0- 4	4- 8	8- 12	12-16	16-20	20-24	24-28
Frequency	5	7	9	17	12	10	6

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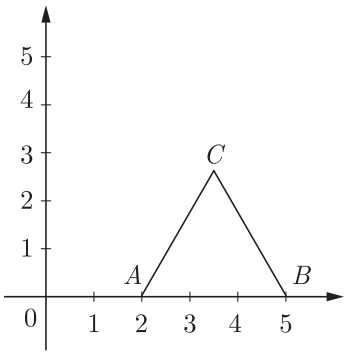
30. Find the ratio in which $P(4, m)$ divides the segment joining the points $A(2,3)$ and $B(6,-3)$. Hence find m.

View Solution

OR

In the given figure ΔABC is an equilateral triangle of side 3 units. Find the co-ordinates of the other two vertices.



31. Given that $\sqrt{5}$ is irrational, prove that $2\sqrt{5}-3$ is an irrational number.

View Solution

Section - D

Section D consists of 4 questions of 5 marks each.

32. For what value of k, which the following pair of linear equations have infinitely many solutions:

View Solution

$2x+3y=7$ and $(k+1)x+(2k-1)y=4k+1$

OR

The cost of 2 kg of apples and 1kg of grapes on a day was found to be Rs. 160. After a month, the cost of 4kg of apples and 2kg of grapes is Rs. 300. Represent the situations algebraically and geometrically.

33. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

View Solution

34. The angles of depression of the top and bottom of an 8 m tall building from top of a multi-storeyed building are 30° and 45°, respectively. Find the height of multi-storey building and distance between two buildings.

View Solution

OR

Two poles of equal heights are standing opposite to each other on either side of a road, which is 80 m wide. From a point between them on the road, angles of elevation of their top are 30° and 60°. Find the height of the poles and distance of point from poles.

35. A solid is in the form of a cylinder with hemispherical end. The total height of the solid is 20 cm and the diameter of the cylinder is 7 cm. Find the total volume of the solid. (Use $\pi = \frac{22}{7}$)

View Solution

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Section - E

Case study based questions are compulsory.

36. Maximum Profit : An automobile manufacturer can produce up to 300 cars per day. The profit made from the sale of these vehicles can be modelled by the function $P(x) = -x^2 + 350x - 6600$ where $P(x)$ is the profit in thousand Rupees and x is the number of automobiles made and sold. Answer the following questions based on this model:

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(i) When no cars are produce what is a profit/loss?

(ii) What is the break even point ? (Zero profit point is called break even) ?

(iii) What is the profit/loss if 175 cars are produced ?

OR

What is the profit if 400 cars are produced ?

37. Rohan is very intelligent in maths. He always try to relate the concept of maths in daily life. One day he is walking away from the base of a lamp post at a speed of 1 m/s. Lamp is 4.5 m above the ground.

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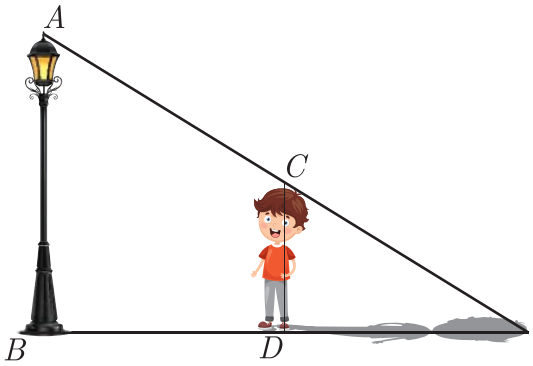

(i) If after 2 second, length of shadow is 1 meter, what is the height of Rohan ?

(ii) What is the minimum time after which his shadow will become larger than his original height?

OR

What is the distance of Rohan from pole at this point ?

(iii) What will be the length of his shadow after 4 seconds?

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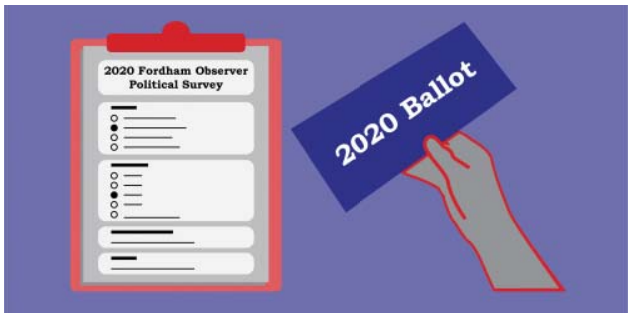
38. View Solution Political survey questions are questions asked to gather the opinions and attitudes of potential voters. Political survey questions help you identify supporters and understand what the public needs. Using such questions, a political candidate or an organization can formulate policies to gain support from these people.



A survey of 100 voters was taken to gather information on critical issues and the demographic information collected is shown in the table. One out of the 100 voters is to be drawn at random to be interviewed on the India Today News on prime time.

	Women	Men	Totals
Republican	17	20	37
Democrat	22	17	39
Independent	8	7	15
Green Party	6	3	5
Totals	53	47	100

(i) What is the probability the person is a woman or a Republican ?

OR

What is the probability the person is a Democrat ?

(ii) What is the probability the person is a Independent men ?

(iii) What is the probability the person is a Independent men or green party men ?

□□□□□□□

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