Sample Paper 06

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 first term of AP is p and the common difference is q, then its 10th term is

(a) $q + 9p$ (b) $p - 9q$

(c) $p + 9q$ (d) $2p + 9q$

2. The co-ordinate of the point dividing the line segment joining the points $A(1, 3)$ and $B(4, 6)$ in the ratio $2 : 1$ is ..... .

(a) (5, 3) (b) (3, 5)

(c) (4, 6) (d) (6, 4)

3. The quadratic equation $5x^2 - 3x + 1 = 0$ has

(a) Two distinct real roots (b) Two equal real roots

(c) No real roots (d) More than 2 real roots

4. What are the values of x and y for the following system of linear equations ?

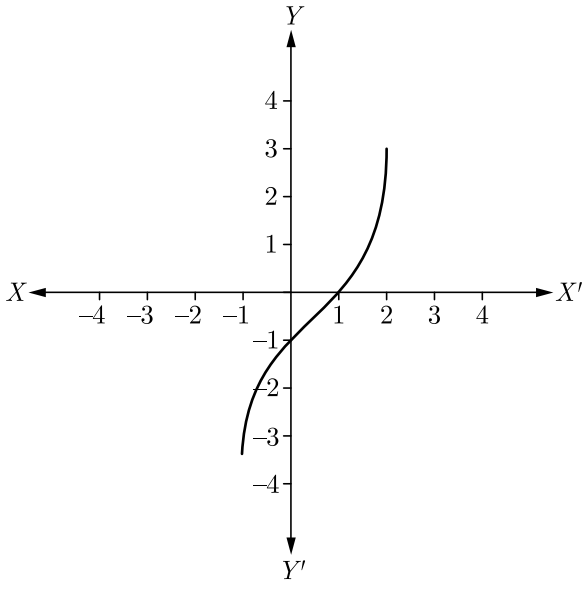
$$2x - y = 2$$
$$x + 3y = 15$$

(a) 4 and 5 (b) 3 and 4

(c) 5 and 4 (d) 4 and 4

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5. In given figure, the graph of a polynomial $p(x)$ is shown. The number of zeroes of $p(x)$ will be



(a) 1 (b) 2
(c) 3 (d) 4

6. If α and β are the zeroes the polynomial $2x^2 - 4x + 5$, the value of $(\alpha - \beta)^2$ is
(a) 2 (b) 1
(c) -1 (d) -6

7. If α and β are the zeroes of a polynomial $x^2 - 4\sqrt{3}\,x + 3$, then the value of $\alpha + \beta - \alpha\beta$ will be
(a) $\sqrt{3}(2 - \sqrt{3})$ (b) $\sqrt{3}(2 + \sqrt{3})$
(c) $\sqrt{3}(4 + \sqrt{3})$ (d) $\sqrt{3}(4 - \sqrt{3})$

8. If $2x + y = 23$ and $4x - y = 19$, the value of $(5y - 2x)$ and $(\frac{y}{x} - 2)$ will be
(a) $-\frac{5}{7}$ and 31 (b) 31 and $-\frac{5}{7}$
(c) 37 and $\frac{2}{7}$ (d) $\frac{2}{7}$ and 37

9. Ratio of lateral surface areas of two cylinders with equal height is
(a) 1 : 2 (b) $H : h$
(c) $R : r$ (d) None of these

10. In the formula $\overline{x} = a + h\left(\frac{\sum f_i u_i}{\sum f_i}\right)$, 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) $\frac{a - x_i}{h}$

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11. In ΔABC, $AB = 6\sqrt{3}$ cm, $AC = 12$ cm and $BC = 6$ cm, then $\angle B =$ ..... .

(a) 30° (b) 60°

(c) 45° (d) 90°

12. The decimal representation of $\frac{21}{16 \times 15}$ will

(a) Terminate after 2 decimal place (b) Terminate after 3 decimal place

(c) Terminate after 4 decimal places (d) Terminate after 5 decimal places

13. $1 + \frac{\cot^2\alpha}{1 + \operatorname{cosec}\alpha} = ?$

(a) $\cos\alpha$ (b) $\tan\alpha$

(c) $\operatorname{cosec}\alpha$ (d) $\sin\alpha$

14. If the first term of an AP is -5 and the common difference is 2, then the sum of the first 6 terms is

(a) 0 (b) 5

(c) 6 (d) 15

15. If $\sin\theta + \sin^2\theta = 1$ then $\cos^2\theta + \cos^4\theta = ?$

(a) 1 (b) 2

(c) $2\sqrt{2}$ (d) $2\sqrt{3}$

16. A bag contains cards with numbers written on it from 1–80. A card is pulled out at random. What is the probability that the card shows a perfect square?

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

(c) $\frac{1}{10}$ (d) $\frac{3}{10}$

17. The ratio of the length of a rod and its shadow is $1 : \sqrt{3}$ then the angle of elevation of the sun is

(a) 90° (b) 45°

(c) 30° (d) 75°

18. If the circumference of a circle and the perimeter of a square are equal, then

(a) Area of the circle = Area of the square

(b) Area of the circle > Area of the square

(c) Area of the circle < Area of the square

(d) Nothing definite can be said about the relation between the areas of the circle and square

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19. **Assertion :** PA and PB are two tangents to a circle with centre O. Such that $\angle AOB = 110^\circ$, then $\angle APB = 90^\circ$.
Reason : The length of two tangents drawn from an external point are equal.
(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 :** The equation $8x^2 + 3kx + 2 = 0$ has equal roots then the value of k is $\pm\frac{8}{3}$.
Reason : The equation $ax^2 + bx + c = 0$ has equal roots if $D = b^2 - 4ac = 0$
(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. If the distance between the points $A(4, p)$ and $B(1, 0)$ is 5 units then what are the values of p?

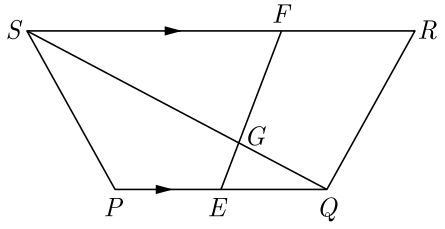
22. Check whether 4^n can end with the digit 0 for any natural number n.

23. If α and β are zeroes of $x^2 - (k-6)x + 2(2k-1)$, find the value of k if $\alpha + \beta = \frac{1}{2}\alpha\beta$.

OR

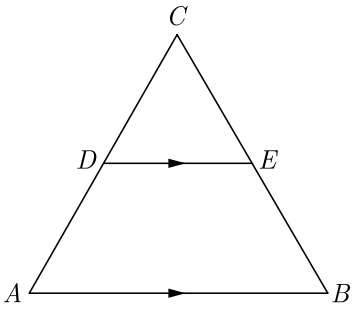
Find the quadratic polynomial, the sum and product of whose zeroes are -3 and 2 respectively. Hence find the zeroes.

24. In the figure, $PQRS$ is a trapezium in which $PQ \,||\, RS$. On PQ and RS, there are points E and F respectively such that EF intersects SQ at G. Prove that $EQ \times GS = GQ \times FS$.



OR

In the given figure, $\angle A = \angle B$ and $AD = BE$. Show that $DE \| AB$.



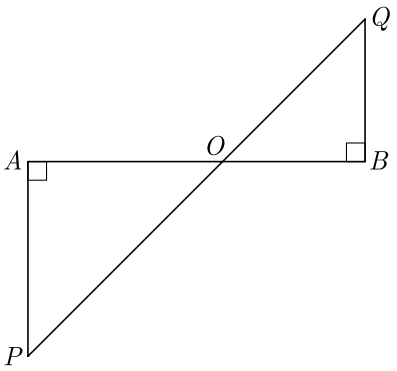
25. Harpreet tosses two different coins simultaneously. What is the probability that she gets :
(i) At least one head ?
(ii) One head and one tail ?

SECTION - C

Section C consists of 6 questions of 3 marks each.

26. If $\sin A = \frac{\sqrt{3}}{2}$, find the value of $2\cot^2 A - 1$.

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



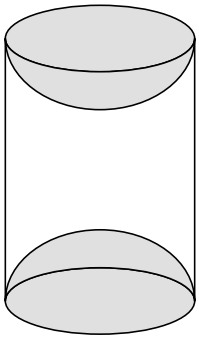
28. If a circle touches the side BC of a triangle ABC at P and extended sides AB and AC at Q and R, respectively, prove that $AQ = \frac{1}{2}(BC + CA + AB)$

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29. If the total surface area of a solid hemisphere is 462 cm^2, find its volume. Use $\pi = \frac{22}{7}$

OR

A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in Figure. If the height of the cylinder is 10 cm and its base is of radius 3.5 cm, find the total surface area of the article.



30. Find the median of the following data :

Height (in cm)	Less than 120	Less than 140	Less than 160	Less than 180	Less than 200
Number of students	12	26	34	40	50

OR

Find the mean of the following distribution :

Height (in cm)	Less than 75	Less than 100	Less than 125	Less than 150	Less than 175	Less than 200
No. of students	5	11	14	18	21	28
Height (in cm)	Less than 225	Less than 250	Less than 275	Less than 300		
No. of students	33	37	45	50		

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. Water is flowing at the rate of 15 km/hr through a cylindrical pipe of diameter 14 cm into a cuboidal pond which is 50 m long and 44 m wide. In what time the level of water in pond rise by 21 cm ?

33. If the roots of the quadratic equation $(x-a)(x-b)+(x-b)(x-c)+(x-c)(x-a)=0$ are equal. Then show that $a=b=c$.

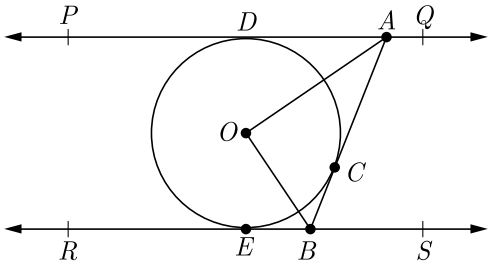
OR

A fast train takes 3 hours less than a slow train for a journey of 60 km. If the speed of the slow train is 10 km/h less than that of the fast train, find the speed of each train.

34. From a point T outside a circle of centre O, tangents TP and TQ are drawn to the circle. Prove that OT is the right bisector of line segment PQ.

OR

In Figure, PQ and RS are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting PQ at A and RS at B. Prove that $\angle AOB = 90^\circ$.

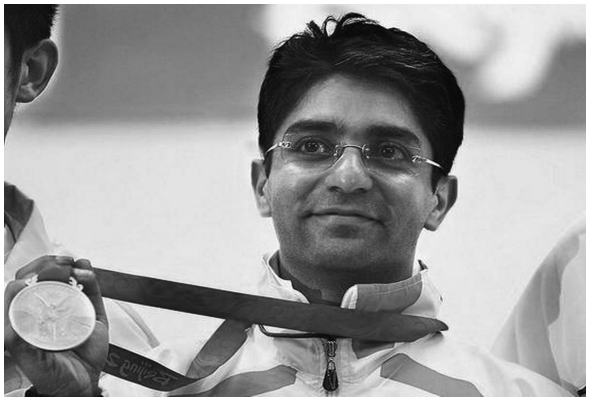


35. Find the ratio in which the point $P(\frac{3}{4}, \frac{5}{12})$ divides the line segment joining the point $A\ (\frac{1}{2}, \frac{3}{2})$ and $(2, -5)$.

SECTION - E

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

36. Abhinav Bindra is retired sport shooter and currently India's only individual Olympic gold medalist. His gold in the 10-meter air rifle event at the 2008 Summer Olympics was also India's first Olympic gold medal since 1980. He is the first Indian to have held concurrently the world and Olympic titles for the men's 10-meter air rifle event, having earned those honors at the 2008 Summer Olympics and the 2006 ISSF World Shooting Championships. Bindra has also won nine medals at the Commonwealth Games and three gold medals at the Asian Games.



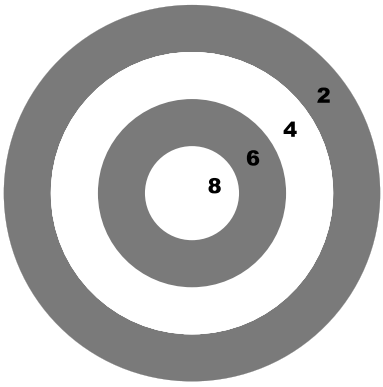
A circular dartboard has a total radius of 8 inch, with circular bands that are 2 inch wide, as shown in figure. Abhinav is still skilled enough to hit this board 100% of the time so he always score at least two points each time he throw a dart. Assume the probabilities are related to area, on the next dart that he throw.

(i) What is the probability that he score at least 4?

(ii) What is the probability that he score at least 6?

(iii) What is the probability that he hit bull's eye ?

(iv) What is the probability that he score exactly 4 points ?



37. TOWER OF PISA : To prove that objects of different weights fall at the same rate, Galileo dropped two objects with different weights from the Leaning Tower of Pisa in Italy. The objects hit the ground at the same time. When an object is dropped from a tall building, it falls about 16 feet in the first second, 48 feet in the second, and 80 feet in the third second, regardless of its weight.

(i) How many feet would an object fall in the sixth second?

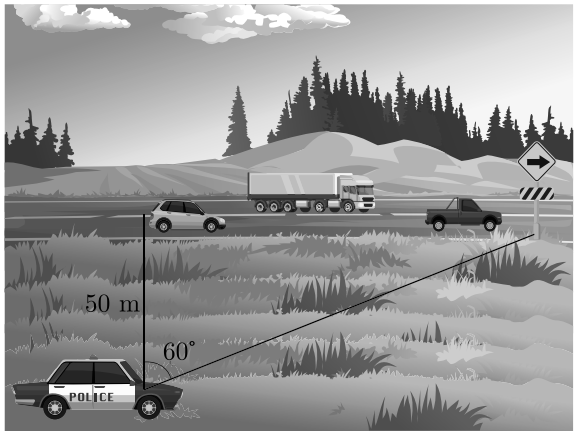
(ii) How many feet would an object fall in the six second?

(iii) How many feet would an object fall in the eight second?



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38. Speed Limit Enforcement : Rajendra works in traffic police and manage traffic on highway. His van is having radar detection equipment. He takes up a hidden position 50 meter from the highway. Using a sighting device he finds the angle between his position and a road sign in the distance is 60°.



He then uses a stop watch to determine how long it takes a vehicle to pass her location and reach the road sign. In quick succession—an 18-wheeler, a truck, and a car pass her position, with the time each takes to travel this distance noted. Find the speed of each vehicle in miles per hour if

(i) The 18-wheeler takes 8 sec,

(ii) The truck takes 6 sec,

(iii) The car takes 4 sec.

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