HP Board Class 12 2026 Mathematics Question Paper

Time Allowed :3 Hours	**Maximum Marks :**80	**Total questions :**32

Section - A

1. The vertex of the parabola $y^2 = 4ax$ **is:**

(A) (4, 0)

(B) (-4, 0)

(C) (0, 4)

(D) (0, 0)

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2. The Value of $\lim_{x \to 0} \frac{\sin x}{x}$ **is:**

(A) 0

(B) 1

(C) -1

(D) 2

3. 1st three terms of the sequence $a_n = 2n + 5$ **is:**

(A) 6, 8, 10

(B) 5, 7, 9

(C) 0, 2, 4

(D) 7, 9, 11

4. The equation of a line in the intercept form is:

(A) $\frac{x}{a} + \frac{y}{b} = 1$

(B) $\frac{x}{a} + \frac{y}{b} = ab$

(C) $ax + by = c$

(D) None of these

5. The derivative of $\sin^2 x$**, w.r.t.** x **is:**

(A) $\cos 2x$

(B) $-\cos^2 x$

(C) $-\sin^2 x$

(D) $\sin 2x$

6. The radian measure of 520° is:

(A) $\frac{25\pi}{9}$

(B) $\frac{26\pi}{9}$

(C) $\frac{13\pi}{9}$

(D) $\frac{24\pi}{9}$

7. Complex conjugate of $3i - 4$ **is:**

(A) $-3i - 4$

(B) $3i + 4$

(C) $-3i + 4$

(D) None of these

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8. If $n = 5$ and $r = 3$, then the value of ^nP_r is:

(A) 20

(B) 30

(C) 50

(D) 60

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9. Assertion (A): When a die is thrown, the event of getting a number greater than 7 is an impossible event. Reason (R): A standard die has six faces, numbered from 1 to 6.

(A) Both Assertion (A) and Reason (R) are the correct explanations of Assertion (A)

(B) Both Assertion (A) and Reason (R) are correct, but Reason (R) is not the correct explanation of Assertion (A)

(C) Assertion (A) is incorrect, but Reason (R) is correct

(D) Assertion (A) is correct, but Reason (R) is incorrect

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10. A person has two parents, 4 grandparents, 8 great grandparents, and so on. Find the number of his ancestors during the ten generations preceding his own.

(A) 2042

(B) 2044

(C) 2046

(D) 2048

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11. Let $A = \{1, 2\}, B = \{3, 4\}$, then the number of relations from A to B is:

(A) 2

(B) 2^2

(C) 2^3

(D) 2^4

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12. Assertion (A): The radius of a circle in which a central angle of 60 degrees intercepts an arc length of 37.4 cm (using $\pi = \frac{22}{7}$)

Reason (R): The formula to calculate the length of an arc is $l = Q \times r$, where l is the arc length, Q is the central angle in radians, and r is the radius of the circle.

(A) Both Assertion (A) and Reason (R) are correct, and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are correct, but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is correct, but Reason (R) is incorrect.

(D) Assertion (A) is incorrect, but Reason (R) is correct.

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13. Assertion (A): The derivative of the function $f(x) = x^2$ with respect to x is $2x$.

Reason (R): The derivative of a power function x^n is given by the formula $\frac{d}{dx}(x^n) = nx^{n-1}$.

(A) Both Assertion (A) and Reason (R) are correct, and Reason (R) is the correct explanation of Assertion (A).

(B) Both Assertion (A) and Reason (R) are correct, but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is correct, but Reason (R) is incorrect.

(D) Assertion (A) is incorrect, but Reason (R) is correct.

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14. $\cos\left(\frac{\pi}{2} + x\right)$ $is equal to$:

(A) $\sin x$

(B) $\cos x$

(C) $-\sin x$

(D) None of these

15. If A = {a,e,i,o,u}, B = {a,b,c}, then A ∪ B is:

(A) {a,e,i,o,u}

(B) {a,b,c,e,i,o,u}

(C) {a,b,c}

(D) {a,e,i,o,u,a,b,c}

16. A collection of most dangerous animals of the world is:

(A) a null set

(B) a finite set

(C) a singleton set

(D) Not a set

Section - B

17. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$**,** $A = \{2, 4, 6, 8\}$**, and** $B = \{2, 3, 5, 7\}$**, verify that** $(A \cup B)' = A' \cap B'$**.**

18. If $f(x) = x^2$**, find** $\frac{f(1.1) - f(1)}{1.1 - 1}$**.**

19. Prove that $\frac{\sin x - \sin y}{\cos x + \cos y} = \tan \frac{x-y}{2}$**.**

20. How many 3-digit even numbers can be formed from the digits 1, 2, 3, 4, 5, 6 if the digits can be repeated?

21. A bag contains 5 black and 6 red balls. Determine the number of ways in which 2 black and 3 red balls can be selected.

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22. The 4th term of a G.P. is square of its second term, and the 1st term is -3. Determine its 7th term.

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23. Show that the points (-2, 3, 5), (1, 2, 3), and (7, 0, -1) are collinear OR verify that the points (0,7,10), (-1,6,6) and (-4,9,6) are the vertices of a right angled triangle.

OR,
Verify that (0,7,10), (-1,6,6) and (-4,9,6) are the vertices of a right angled triangle.

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24. For some constants a and b, find the derivative of $\frac{x-a}{x-b}$

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25. If $\frac{2}{11}$ is the probability of an event, what is the probability of the event 'not A'?

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26. Find the multiplicative inverse of $\sqrt{5} + 3i$

OR,
Express the given complex number in the form of $a + ib$: $\left(\frac{1}{3} + 3i\right)^3$

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27. Solve the given inequality for real x:

$$\frac{3(x-2)}{5} \leq \frac{5(2-x)}{3}$$

OR,

Solve the given inequalities and represent the solution graphically on the number line:

$$2(x-1) < x+5, \quad 3(x+2) > 2-x$$

28. Using Binomial Theorem, Evaluate: $(102)^5$

OR,

Evaluate $\left(\sqrt{3}+\sqrt{2}\right)^6 - \left(\sqrt{3}-\sqrt{2}\right)^6$

29. Find the equation of the right bisector of the line segment joining the points $(3,4)$ **and** $(1,2)$**.**

OR,

The vertices of $\triangle PQR$ **are** $P(2,1)$**,** $Q(-2,3)$**, and** $R(4,5)$**. Find the equation of the median through the vertex** R**.**

30. Find the values of the other five trigonometric functions, if $\cos x = -\frac{1}{2}$**, and** x **lies in the third quadrant.**

31. The sum of the first three terms of a G.P. is 16 and the sum of the next three terms is 128. Determine the 1st term, the common ratio, and the sum to n **terms of the G.P.**

OR,

Find the value of 'n' so that $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ may be the geometric mean between a and b.

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32. Find the coordinates of the focus, axis of the parabola, the equation of the directrix, and the length of the latus rectum, if $y^2 = 12x$.

OR,

Find the coordinates of the foci, the vertices, the length of the major axis, the minor axis, the eccentricity, and the length of the latus rectum of the ellipse:

$$\frac{x^2}{36} + \frac{y^2}{16} = 1$$