



Pakistan School, Ministry of Education, Kingdom of Bah

Pre Board Examination, June-2021

Paper: Mathematics

Time allowed: 25 minutes

Class : XII

Max. Marks: 20

Name:-----

Version Number	2	4	6	8
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Note: Section-A is compulsory and comprises pages 1-2. All parts of this section are to be answered on the question paper itself. It should be completed in the first 20 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

SECTION – A

Q.1 Circle the correct option i.e A/B/C/D . Each part carries one mark.

(i) Domain of $f(x) = \sqrt{x^2 - 9}$ is:

- A. $R - (-3, 3)$ B. $R - [-3, 3]$ C. $[3, \infty)$ D. $(-\infty, -3]$

(ii) $\lim_{x \rightarrow 0} (x+1)^x$ is:

- A. 1 B. e C. ∞ D. 0

(iii) What is the value of $g(x)$ if $f(x) = \frac{2x}{3x+4}$ and $f[g(x)] = x$?

- A. $\frac{2+3x}{4x}$ B. $\frac{4x}{2+3x}$ C. $\frac{4x}{2-3x}$ D. $\frac{2-3x}{4}$

(iv) If $f(x) = a + x$ then which of the following options is correct?

- A. $f'(0) \cdot f'(1) = 0$ B. $f'(0) < f'(1)$ C. $f'(0) > f'(1)$ D. $f'(0) = f'(1)$

(v) $x = am^2$, $y = 2am$ are the parametric equation of the curve:

- A. $x^2 = 4ay$, B. $x^2 + y^2 = a^2$, C. $y^2 = 4ax$, D. None

(vi) $\int \tan x dx =$ -----

- A. $\ln \cos x + c$, B. $\sec^2 x + c$, C. $\ln \sec x + c$, D. None

(vii) Which of the following represents $\frac{dy}{dx}$ if $\sin x = e^y$?

- A. $-\cot x$ B. $\tan x$ C. $-\tan x$ D. $\cot x$

(viii) What evaluates $\int_2^\infty \frac{dx}{x^2}$?

- A. 0 B. $-\frac{1}{2}$ C. $\frac{1}{2}$ D. $\frac{1}{24}$

(ix) For what value of k , $\int_{-3}^3 (x^5 + k) dx = 30$?

- A. -5 B. $-35\frac{1}{2}$ C. 0 D. 5

(x) Which of the following points is at a distance of 15 units from (0, 0)?

- A. (1, 15) B. (10, -10) C. $(\sqrt{176}, 7)$ D. (7, 176)

(P.T.O)

- (xi) What is the perpendicular distance of a point (2,3) from y-axis?
 A. 2 B. $\sqrt{13}$ C. 3 D. 5
- (xii) At what angle lines $7y = 5x + 8$ and $7x + 5y = 16$ intersect each other?
 A. 0 B. $\frac{\pi}{2}$ C. $\frac{\pi}{4}$ D. π
- (xiii) What is the slope of a line perpendicular to $13x + 26y - k = 0$?
 A. $-\frac{1}{2}$ B. -2 C. $\frac{1}{2}$ D. 2
- (xiv) Which point in the following is not a solution of $2x - 3y < 5$?
 A. (-1, -1) B. (2, -2) C. (2, 2) D. (3, 3)
- (xv) The centre of a circle $x^2 + y^2 + 6x - 10y - 15 = 0$ is:
 A. (5, 3) B. (5, -3) C. (-3, 5) D. (3, 5)
- (xvi) If $e < 1$, then the conic is called:
 A. Parabola B. Circle C. Hyperbola D. Ellipse
- (xvii) The focus of a parabola $x^2 = -16y$ is:
 A. (-4, 0) B. (0, -4) C. (4, -4) D. (0, ± 4)
- (xviii) Which of the following is an axis of the parabola $(y + 3)^2 = 12 \left(x + \frac{1}{2}\right)$?
 A. $y = -3$ B. $x = -\frac{1}{2}$ C. $x = \frac{1}{2}$ D. $y = 3$
- (xix) What is the volume of a parallelepiped determined by $\underline{i} + 2\underline{j} - \underline{k}$, $\underline{i} - 2\underline{j} + 3\underline{k}$ and $\underline{i} - 7\underline{j} - 4\underline{k}$?
 A. 20 B. 48 C. 8 D. 38
- (xx) $(\underline{i} + 2\underline{j}) \times \underline{k} = ?$
 A. $3\underline{i} - \underline{j}$ B. $2\underline{i} - \underline{j}$ C. $2 + 2\underline{k}$ D. None of these

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Q. No.1: Total Marks:

20

Marks Obtained:



Pakistan School, Ministry of Education, Kingdom of Bahrain

Pre Board Examination, June-2021

Paper: Mathematics

Time allowed: 2.35 Hours

Class : XII

Max. Marks : 80

Note: Sections 'B' and 'C' comprise pages 1-2 and questions therein are to be answered on the separately provided answer book. Answer any ten questions from section 'B' and attempt any five questions from section 'C'. Use supplementary answer sheet i.e., sheet B if required. Write your answers neatly and legibly.

SECTION-B

Q. 2 Attempt any TEN parts. All parts carry equal marks. (10 x 4 = 40)

(i) Evaluate $\lim_{\theta \rightarrow 0} \frac{1 - \cos p\theta}{1 - \cos q\theta}$.

(ii) Find the values of m and n so that the given function f is continuous:

$$f(x) = \begin{cases} mx & \text{if } x < 3 \\ n & \text{if } x = 3 \\ -2x + 9 & \text{if } x > 3 \end{cases}$$

(iii) If $y = \tan(p \tan^{-1} x)$ then show that $(1 + x^2)y_1 - p(1 + y^2) = 0$

(iv) Find the intervals in which the functions $f(x) = x^2 + 3x + 2$; $x \in (-4, 1)$ is: increasing or decreasing for the given domain.

(v) Divide 20 into two parts so that the sum of their squares will be minimum.

(vi) Evaluate the given integral by parts : $\int x \tan^{-1} x \, dx$

(vii) Find the area above x-axis, bounded by the curve $y^2 = 3 - x$ from $x = -1$ to $x = 2$

(viii) Evaluate the indefinite integral : $\int \frac{dx}{x^2 + 4x + 13}$

(ix) Find an equation of the line through (5, -8) and perpendicular to the joint of A(-15, -8) and B (10, 7).

(x) Find the point which is equidistant from the points A (5, 3), B (-2, 2) and C (4, 2).

(xi) Find the centre and radius of the circle $x^2 + y^2 + 12x - 10y = 0$

(xii) Write equation of tangent to parabola $x^2 = 16y$ at the point whose abscissa is 8.

(xiii) Write equation of the tangent to the conic $3x^2 = -16y$ at the point whose ordinate is -3.

(xiv) Find a vector whose magnitude is 4 and is parallel to vector $2\hat{i} - 3\hat{j} + 6\hat{k}$.

(P.T.O)

SECTION – C(Marks: 40)

Note: **Attempt any FIVE questions. Each question carries equal marks.**
(Marks:5×8=40)

Q. 3 If θ is measured in radians, then prove that $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$

Q. 4. If $x = \sin \theta$, $y = \sin m\theta$, show that $(1 - x^2) y_2 - xy_1 + m^2 y = 0$

Q. 5 Show that $\int e^{ax} \cos bx \, dx = \frac{1}{\sqrt{a^2 + b^2}} e^{ax} \cos(bx - \tan^{-1} \frac{b}{a}) + c$

Q. 6 Show that the lines $4x - 3y - 8 = 0$, $3x - 4y - 6 = 0$ and $x - y - 2 = 0$ are concurrent and the third line bisects the angle formed by the first two lines.

Q. 7 Graph the feasible region of the system of linear inequalities and find the corner points :
 $3x + 2y \geq 6$, $x + y \leq 4$, $x \geq 0$, $y \geq 0$

Q. 8 Show that tangent at any point P of a parabola makes equal angles with the line PF and the line through P , parallel to the axis of the parabola, F being focus.

Q. 9 Find a unit vector perpendicular to the plane containing $\underline{a}$ and $\underline{b}$. Also find sine of the angle between them.
 $\underline{a} = -\underline{i} - \underline{j} - \underline{k}$, $\underline{b} = 2\underline{i} - 3\underline{j} + 4\underline{k}$.

BEST OF LUCK