

Form A ; Instructions : (33 points). Solve each of the following problems and choose the correct answer.

(1) **The domain of the function $f(x) = |3x - 6|$ is**

- (a) $\mathbb{R} - \{2\}$
- (b) $[2, \infty)$
- (c) $\mathbb{R} - \{-2\}$
- (d) \mathbb{R}

(2) **The domain of the function $f(x) = \frac{x + 2}{x^2 + x - 6}$ is**

- (a) $\mathbb{R} - \{-2, 3\}$
- (b) $\mathbb{R} - \{-2, -3\}$
- (c) $\mathbb{R} - \{2, -3\}$
- (d) $\mathbb{R} - \{2, 3\}$

(3) **The domain of the function $f(x) = \sqrt{4 - x^2}$ is**

- (a) $(-2, 2)$
- (b) $[-2, 2]$
- (c) $(-\infty, -2] \cup [2, \infty)$
- (d) $(2, \infty)$

(4) **The range of the function $f(x) = \sqrt{25 + x^2}$ is**

- (a) $(-\infty, 5]$
- (b) $(-\infty, 5)$
- (c) $(5, \infty)$
- (d) $[5, \infty]$

(5) **The range of the function $f(x) = 9 - x^2$ is**

- (a) $(-\infty, 9]$
- (b) $[9, \infty)$
- (c) $(-\infty, -9]$
- (d) $[-9, \infty)$

(6) **The function $f(x) = 10 - x^3$ is even.**

- (a) **True**
- (b) **False.**

(7) **The function $f(x) = x^{\frac{2}{3}} + x^2$ is**

- (a) **Algebraic function**
- (b) **Power function**
- (c) **Polynomial function**
- (d) **Exponential function.**

(8) **If $h(x) = |\cos x|$, $f(x) = \cos x$, $g(x) = |x|$, then $h =$**

- (a) $f \circ g$
- (b) $g \circ f$
- (c) $f g$
- (d) $f \circ f$

(9) **The function $f(x) = \frac{7 - x^2}{x^3 + 3x}$ is symmetric about the origin.**

- (a) **True**
- (b) **False.**

(10) **The function $f(x) = (x - 1)^2$ is**

- (a) **increasing on $(1, \infty)$**
- (b) **increasing on $(-\infty, 1)$**
- (c) **decreasing on $(1, \infty)$**
- (d) **decreasing on $(-1, \infty)$**

(11) **The degree measure of $\theta = \frac{7\pi}{6}$ is**

- (a) 100°
- (b) 120°
- (c) 210°
- (d) 75°

(12) **The radian measure of $\theta = 150^\circ$ is**

(a) $\frac{5\pi}{6}$

(b) $\frac{10\pi}{3}$

(c) $\frac{10\pi}{9}$

(d) $\frac{4\pi}{3}$

(13) **If $f(x) = x^2$ and $g(x) = \sqrt{2+x}$, then $(f \circ g)(x) =$**

(a) $2 + x^2$

(b) $\sqrt{2+x^2}$

(c) $(2+x)^2$

(d) $2+x$

(14) **If $f(x) = x$ and $g(x) = 3x^2 + x$, then $(\frac{f}{g})(x) =$**

(a) $\frac{x}{3x^2 - 1}$

(b) $\frac{1}{3x + 1}$

(c) $\frac{1}{3x - 1}$

(d) $\frac{x}{3x^2 + 1}$

(15) **If $f(x) = \sqrt{x}$ and $g(x) = \sqrt{2-x}$, then the domain of $(f+g)(x)$ is**

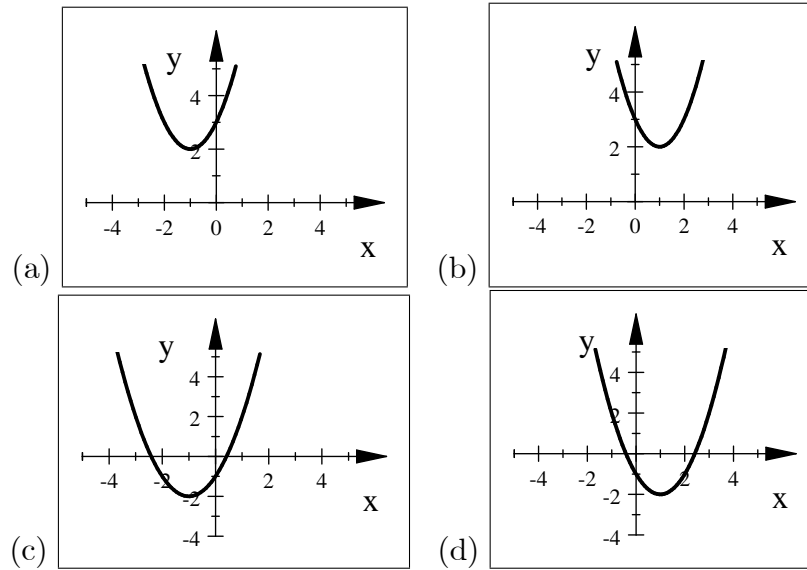
(a) $(-\infty, 2]$

(b) $[0, 2]$

(c) $[0, \infty)$

(d) $(0, 2)$

(16) The graph of the function $f(x) = (x + 1)^2 + 2$ is



(17) The graph of $g(x) = |x - 4|$ is a shifting of the graph of $f(x) = |x|$

- (a) 4 units to the left
- (b) 4 units to the right
- (c) 4 units downward
- (d) 4 units upward.

(18) If the graph of $f(x) = 3^x$ is reflected about the y -axis, then the equation of the new function is

- (a) $(\frac{1}{3})^{-x}$
- (b) $(-3)^x$
- (c) $(\frac{1}{3})^x$
- (d) $-(3^x)$

(19) If $\cos x = \frac{3}{2}$, $\sin x = \frac{1}{2}$ then $\sin(2x) =$

- (a) $\frac{3}{2}$
- (b) 2
- (c) 4
- (d) $\frac{3}{4}$

(20) **The function $f(x) = \left(\frac{1}{2}\right)^x$ is increasing on \mathbb{R} .**

- (a) **True**
- (b) **False.**

(21) **If $\sin \theta = \frac{3}{4}$ and $0 < \theta < \frac{\pi}{2}$, then $\cos \theta =$**

- (a) $\frac{-3}{\sqrt{7}}$
- (b) $\frac{-\sqrt{7}}{4}$
- (c) $\frac{3}{\sqrt{7}}$
- (d) $\frac{\sqrt{7}}{4}$

(22) **If $\theta = \frac{-\pi}{3}$, then $\sin \theta =$**

- (a) $\frac{1}{2}$
- (b) $\frac{\sqrt{3}}{2}$
- (c) $\frac{-\sqrt{3}}{2}$
- (d) $\frac{-1}{2}$.

(23) **The range of the function $f(x) = \sin x$ is**

- (a) \mathbb{R}
- (b) $(-1, 1)$
- (c) $\mathbb{R} - (-1, 1)$
- (d) $[-1, 1]$

(24) **The function $f(x) = \cot x$ is**

- (a) **even**
- (b) **odd**
- (c) **even and odd**
- (d) **neither even nor odd.**

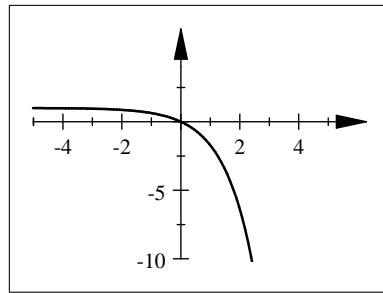
(25) If a is a positive number and x, y are real numbers, then $(a^x)^y =$

- (a) a^{x+y}
- (b) a^{xy}
- (c) $a^x a^y$
- (d) $a^{x/y}$

(26) The range of the function $y = 2^x + 1$ is

- (a) $(1, \infty)$
- (b) $[1, \infty)$
- (c) $(-\infty, 1)$
- (d) $(-\infty, 1]$

(27) The following graph represent the function $f(x) =$



- (a) $-e^x - 1$
- (b) $e^{-x} + 1$
- (c) $e^{-x} - 1$
- (d) $1 - e^x$

(28) The domain of the function $f(x) = \frac{1}{1 - e^{2x}}$ is

- (a) $\mathbb{R} - \{0\}$
- (b) $\mathbb{R} - \{1\}$
- (c) $\mathbb{R} - \{0, 1\}$
- (d) \mathbb{R}

(29) If $f(x) = 3x + 2$ then $f^{-1}(x) =$

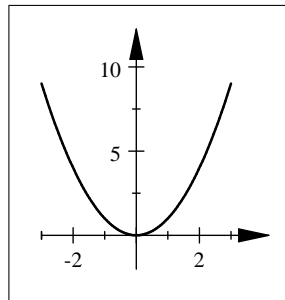
(a) $\frac{x - 3}{2}$

(b) $\frac{x + 3}{2}$

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

(d) $\frac{x + 2}{3}$

(30) The following graph represents one - to - one function



- (a) True
(b) False.

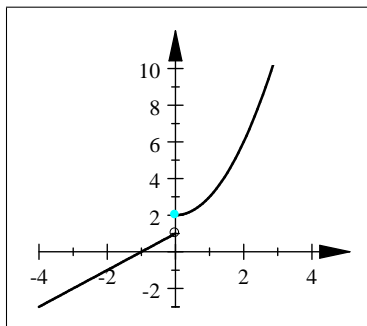
(31) The range of the function $f(x) = \sqrt{x}$

- \mathbb{R}
- $\mathbb{R} - \{0\}$
- $[0, \infty)$
- $(0, \infty)$

(32) One of the following identities is true

- $\cos(2x) = \cos^2 x - \sin^2 x$
- $\cos(2x) = \cos^2 x + \sin^2 x$
- $\cos(2x) = \cos^2(2x) - \sin^2(2x)$
- $\cos(2x) = 2 \sin x \cos x$

(33) The following graph



represents the function :

(a) $f(x) = \begin{cases} x^2 + 2 & \text{if } x > 0 \\ x + 1 & \text{if } x \leq 0 \end{cases}$

(b) $f(x) = \begin{cases} x^2 + 2 & \text{if } x \geq 0 \\ x + 1 & \text{if } x < 0 \end{cases}$

(c) $f(x) = \begin{cases} x^2 + 2 & \text{if } x < 0 \\ x + 1 & \text{if } x \geq 0 \end{cases}$

(d) $f(x) = \begin{cases} x^2 + 2 & \text{if } x \leq 0 \\ x + 1 & \text{if } x > 0 \end{cases}$