

For any question you may answer E) "None Of The Answers".

1) Which of the following would have a graph found by taking the graph $y = f(x)$, stretching it vertically by a factor of 3 and reflecting in the x-axis?

- A) $y = -f(3x)$
- B) $y = f(-3x)$
- C) $y = 3f(-x)$
- D) $y = -3f(x)$
- E) NOTA

2) What is the sum of the roots of the quadratic equation $x^2 - 526x + 62769 = 0$?

- A) -76
- B) 486
- C) 526
- D) 704
- E) NOTA

3) If $f(x) = x^2 - 2$ and $g(x) = 2x^2 + 3$, then $(f \circ g)(x) = ?$

- A) $2x^4 - x^2 - 6$
- B) $2x^4 - 8x^2 + 11$
- C) $4x^4 + 12x^2 + 7$
- D) $4x^4 - 6$
- E) NOTA

4) The inverse of $f(x) = \frac{x-1}{x+2}$ is?

- A) $f^{-1}(x) = \frac{2x-1}{1+x}$
- B) $f^{-1}(x) = \frac{2x+1}{1-x}$
- C) $f^{-1}(x) = \frac{x+2}{x-1}$
- D) $f^{-1}(x) = \frac{x+1}{1-2x}$
- E) NOTA

5) Which is the largest value?

- A) $6 \times 3 + 4 \div 2 - 1$
- B) $6 \times (3 + 4 \div 2 - 1)$
- C) $6 \times 3 + 4 \div (2 - 1)$
- D) $6 \times (3 + 4) \div 2 - 1$
- E) NOTA

6) Which of the following is equivalent to $\ln(x + y)$?

- A) $\ln x + \ln y$
- B) $\ln x \ln y$
- C) $\ln(xy)$
- D) $\frac{\ln x}{\ln y}$
- E) NOTA

7) The statement $a + b = b + a$ shows that addition has which property?

- A) Associative
- B) Commutative
- C) Distributive
- D) Reciprocal
- E) NOTA

8) The determinant of $\begin{bmatrix} 4 & -2 \\ 2 & 1 \end{bmatrix}$ is:

- A) 0
- B) 5
- C) 8
- D) The matrix has no determinant
- E) NOTA

9) Which will be true about the graph of a polynomial of degree 8:

- A) It will have y-axis symmetry.
- B) It will have origin symmetry.
- C) The end behavior will be the same left and right.
- D) It will have 7 turning points
- E) NOTA

10) The exponential form of $\sqrt[4]{\sqrt[3]{\sqrt{x}}}$ = ?

- A) $x^{\frac{1}{3}}$
- B) $x^{\frac{1}{9}}$
- C) $x^{\frac{13}{12}}$
- D) $x^{\frac{1}{24}}$
- E) NOTA

11) What is the range of $f(x) = 2 - 2x - x^2$?

- A) $(1, \infty)$
- B) $(2, \infty)$
- C) $(-\infty, 2)$
- D) $(-\infty, 3)$
- E) NOTA

12) What term will complete the square for the expression $3x^2 + 6x$?

- A) 1
- B) 3
- C) 9
- D) 36
- E) NOTA

13) The asymptotes of the graph $f(x) = \frac{4x-1}{x-3}$ intersect at which point?

- A) (3,1)
- B) (3,4)
- C) (4,3)
- D) $\left(\frac{1}{4}, 3\right)$
- E) NOTA

14) The domain of $f(x) = e^{x-1} + 3$ is:

- A) $(0, \infty)$
- B) $(1, \infty)$
- C) $(3, \infty)$
- D) $(-\infty, \infty)$
- E) NOTA

15) A solution of $\log_2(x-3) + \log_2(x+1) = 5$ is?

- A) -5
- B) $-\frac{35}{31}$
- C) 4
- D) 7
- E) NOTA

16) The center of the circle graphed by $x^2 + y^2 + 4x - 10y + 20 = 0$ is?

- A) (-2,5)
- B) (2,-5)
- C) (4,-10)
- D) (-4,10)
- E) NOTA

17) Which of the following is **NOT** a polynomial?

- A) $\sqrt{x^2 - 6x + 9}$
- B) $\frac{3x^5 - 7x^3 + 13x^2}{9x^2}$
- C) $2x - \sqrt{x} + 5$
- D) $x(x^3 - 3x + x^{-1})$
- E) NOTA

18) Simplify $(2x)^{-1} + (3x)^0 + (4x)^1$

- A) $\frac{4x^2 + x + 2}{2x}$
- B) $\frac{4x^2 + 3x + 2}{x}$
- C) $\frac{8x^2 + 2x + 1}{2x}$
- D) $9x$
- E) NOTA

19) When $3x^4 - 2x^2 + 7x - 29$ is divided by $x - 2$, the remainder is?

- A) -3
- B) 11
- C) 25
- D) 47
- E) NOTA

20) If x is an integer, then $(2x + 1)(x + 4) - x(x + 5)$ will always be?

- A) A perfect square
- B) A prime number
- C) Even
- D) Odd
- E) NOTA

21) If $x = xy + \frac{y}{z} \div \frac{z}{t}$ then which of the following is true?

A) $x = \frac{y}{t(1-y)}$

B) $x = \frac{(y-1)z}{ty}$

C) $x = \frac{ty}{z^2(1-y)}$

D) $x = \frac{y+z}{t^2-1}$

E) NOTA

22) The sum of the solutions of $7 + 2x = |1 - x|$ is:

A) -10

B) $-\frac{14}{3}$

C) $\frac{2}{3}$

D) -2

E) NOTA

23) A length of piping must be cut into twelve equal parts. If it takes 6 minutes to cut it into three parts, how much longer will be needed to finish the job?

A) 24 minutes

B) 27 minutes

C) 33 minutes

D) 36 minutes

E) NOTA

24) The quadratic equation $ax^2 + bx + c = 0$ has coefficients a, b, c all positive. If

$\frac{2a}{b} > \frac{b}{2c}$ then the roots of the equation will definitely be:

- A) Positive
- B) Equal
- C) Real
- D) Complex
- E) NOTA

25) For what value of a will $x + 3$ divide evenly into/be a factor of

$2x^3 + 3x^2 - x + a$?

- A) -78
- B) -36
- C) 24
- D) 40
- E) NOTA