

ALGEBRA I INDIVIDUAL TEST

Select the best answer from the choices given. If the answer does not appear use E)NOTA

1) Identify the axiom of the real numbers, that is illustrated by the following

$$\forall a, b, c \in \mathbb{R}; (a+b) \cdot c = c \cdot (a+b)$$

- A) Associative Property for Addition
- B) Commutative Property for Multiplication
- C) Distributive Property for Multiplication over Addition
- D) Reflexive Property for Equality
- E) NOTA

2) Solve for m in the following equation:

$$rs = \frac{2m+3}{ms}$$

A) $m = \frac{2m+3}{rs^2}$

B) $m = \frac{rs^2}{5}$

C) $m = 5$

D) $m = \frac{3}{rs^2 - 2}$

E) NOTA

3) John bought an item and gave the clerk a dollar. The clerk misread the cash register and switched the digits when he made change. John later returned the item and realized that he had twenty-seven cents more than when he started. If the sum of the digits in the incorrect change was nine, how much did the item cost?

A) 63

B) 64

C) 72

D) 82

E) NOTA

4) If an equation has as its solution set $\{-5, 2\}$, then which of the following could be that equation?

A) $x^2 - 3x - 10 = 0$

B) $x^2 - 3x + 10 = 0$

C) $-\frac{1}{3}x^2 + x - \frac{10}{3} = 0$

D) $2x^2 + 6x - 20 = 0$

E) NOTA

5) The sum of the digits of a three digit number is 16. Twice the hundred's digit is three more than the units digit. Half the ten's digit is one half less than the hundred's digit. Find the number.

A) 239

B) 393

C) 475

D) 547

E) NOTA

6) Factor the following completely over the real numbers.

$$x^8 - 256$$

A) $(x-2)(x+2)(x-2)(x+2)(x^4+16)$

B) $(x^2+4)(x^2+4)(x^4+16)$

C) $(x-2)(x+2)(x-2)(x+2)(x-2)(x+2)$

D) $(x-2)(x+2)(x^2+4)(x^4+16)$

E) NOTA

7) Solve for x : $2^{\frac{1}{x}} = 16$

A) -4

B) $-\frac{1}{4}$

C) $\frac{1}{4}$

D) 4

E) NOTA

8) Find the equation of a line parallel to $3x - 8y = -7$ and passing through the point (3,8).

A) $8y - 3x - 55 = 0$

B) $-8y + 3x - 55 = 0$

C) $8y - 3x + 55 = 0$

D) $9y - 3x + 55 = 0$

E) NOTA

9) If $f(x) = 5x - 3$ and $g(x) = x^3 + 1$, then $f(6) + g(2)$ is:

A) 12

B) 36

C) 122

D) 224

E) NOTA

10) A scientist has 15 quarts of a solution which is 11% acid. She wished to create a solution which is 18% acid by removing a certain amount of her solution and replacing it with a solution which is 32% acid. How much must she replace?

A) 3

B) 5

C) $5\frac{1}{2}$

D) 10

E) NOTA

11) Find the sum of the first n even whole numbers.

A) $\frac{n+(n+1)}{2}$

B) $\frac{n+(n+2)}{n}$

C) $\frac{n+n^2}{n}$

D) $n^2 - n$

E) NOTA

12) Evaluate: $-6^0 + 16^{\frac{1}{2}} - 5^2 + 2^{-3} - \left(\frac{1}{2}\right)^3$

- A) -20 B) -22 C) -21 D)
- $\frac{74}{25}$
- E) NOTA

13) What is the degree of the polynomial $x^2 + y^7 + z^3y^6$

- A) 2 B) 3 C) 7 D) 9 E) NOTA

14) Convert 5656₇ to base 5.

- A) 312
- ₅
- B) 31122
- ₅
- C) 3120
- ₅
- D) 31200
- ₅
- E) NOTA

15) Which of the following expressions is ALWAYS true for all real numbers, x?

- A)
- $\frac{x}{x} = 1$
- B)
- $\sqrt{x^2} = x$
- C)
- $-x \leq 0$
- D)
- $|x| = x$
- E) NOTA

16) What is the sum of the coordinates of the midpoint of the line segment with endpoints (-3, 8) and (15, -6)?

- A) -5 B) 5 C) 7 D) 16 E) NOTA

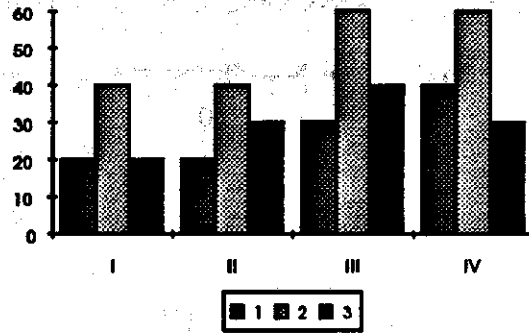
17) Y is inversely proportional to the square of x and y=3 when x=2. Find y when x=3.

- A)
- $\frac{4}{3}$
- B) 2 C)
- $\frac{9}{2}$
- D)
- $\frac{27}{4}$
- E) NOTA

18) Simplify: $\left(\frac{8x^7y^{-3}}{-27xy^3}\right)^{-\frac{1}{3}}$

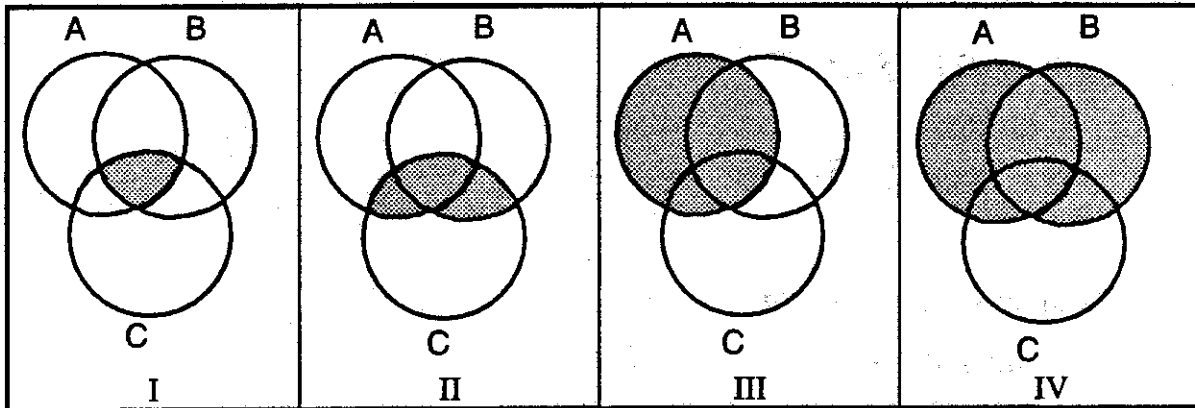
- A)
- $-\frac{2x^2}{3y^2}$
- B)
- $-\frac{3}{2x^2}$
- C)
- $-\frac{8}{27}x^6$
- D)
- $\frac{3y^2}{2x^2}$
- E) NOTA

19. Which bar graph shows a 50% increase followed by a 50% decrease?



- A) I B) II C) III D) IV E) NOTA

20. Which VENN diagram shows $(A \cup B) \cap C$



- A) I B) II C) II D) IV E) NOTA

21. Which of the following is NEVER true for any real number, x?

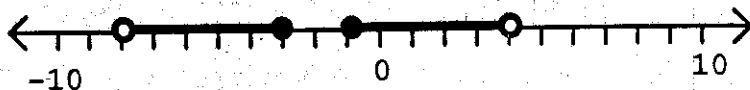
- A) $x^2 = x$ B) $x = -x$ C) $|x| = -x$ D) $x = x+1$ E) NOTA

22. Simplify the following expression:

$$\frac{x^4 + 2x^3 - 3x^2 - 4x + 4}{x^3 + 3x^2 - 4} + 1$$

- A) $x-1$ B) x C) $x+1$ D) $x^2 + 2x - 7$ E) NOTE

23) Which of the following represents this graph?



A) $\{4\} \cup \{1\} \cup \left| x + \frac{13}{2} \right| < \frac{5}{2} \cup \left| x - \frac{3}{2} \right| < \frac{5}{2}$

B) $\{-4\} \cup \{-1\} \cup \left| x + \frac{13}{2} \right| < 5 \cup \left| x - \frac{3}{2} \right| < 5$

C) $\{x | -8 < x \leq -3\} \cup \{x | -1 \leq x < 4\}$

D) $\{x | -8 < x < 4\} \cup \{x | -3 \leq x \leq -1\}$

E) NOTA

24) Simplify $\sqrt{48}\sqrt{27} + (2\sqrt{18} + \sqrt{50})\sqrt{16}$

A) $4\sqrt{167}$

B) 98.225396

C) $\sqrt{1296} + \sqrt{1152} + \sqrt{800}$

D) $36 + 44\sqrt{2}$

E) NOTA

25) Factor $a^3 + a^2c + 2a^2b + 2abc + b^2a + b^2c$

A) $(a^2 + b)(a + c)$

B) $(a + b)(a + c)^2$

C) $(a + b)^2(a + c)$

D) $(a + b + c)^2$

E) NOTA

26) What would be the formal statement of the DISTRIBUTIVE PROPERTY OF ADDITION OVER MULTIPLICATION in the set X.

A) $\forall a, b, c \in X, a + bc = (a + b)(a + c)$

B) $\forall a, b, c \in X, a(b + c) = ab + ac$

C) $\forall a, b, c \in X, a(b + c) = (b + c)a$

D) $\forall a, b, c \in X, a + (b + c) = (a + b) + c$

E) NOTA

27) Leticia took 5 math tests and got the following grades. 80, 83, 86, 78, and 90. If the second grade counts double, what must Leticia get on the next test to get an average of 83?

A) 80

B) 81

C) 82

D) 83

E) NOTA

28) Determine the sum of the slope and the y-intercept of the following equation:

$$6x - 5y = 13.$$

- A) $-\frac{5}{6}$ B) 1 C) $-\frac{7}{5}$ D) $\frac{5}{19}$ E) NOTA

29) Three consecutive odd integers have a sum of 57. What is the product of the first and last?

- A) 38 B) 323 C) 357 D) 437 E) NOTA

30) Find the value of k such that $(x-2)$ divides evenly into $x^3 - 3x^2 - 18x + k$.

- A) 40 B) 60 C) 80 D) 100 E) NOTA