ALGEBRA I March 1996

NOTE: Answer e) NOTA, stands for None of the Above. Choose this answer when you feel that no other answer given is correct.

1) Simplify the following: $36 \div \left[\left(\sqrt[3]{-8} + 1 \right) \left(3^2 \right) \right]$.

a. -4 b. -2 c. 2 d. 4 e. NOTA

2) If $2(3x - 2) = 2x - 12$, then find x squared.

a. 2 b. 6 c. 25/4 d. 16 e. NOTA

3) Two paving companies are to pave 34 miles of road. One crew is to pave at a rate that is three miles per week faster than the other crew. If they start at opposite ends and it takes two weeks to complete the job, then find the sum of the rates of the two crews?

a. 10 b. 13 c. 14 d. 17 e. NOTA

4) Find the sum of all of the solutions for $2 | x | - 3 = 11$.

a. -3 b. -1 c. 0 d. 7 e. NOTA

5) With a given range from -5 to 5 and a given domain also from -5 to 5 on the Cartesian Coordinate Plane, find the quadrant which holds the largest portion of the solution for the system $y > x + 1$ and $y > 0$.

a. I b. II c. III d. IV e. NOTA

6) Find the sum of the solutions of $x^2 - 6x + 18 = 0$.

a. 3 b. 6 c. 7 d. 18 e. NOTA

7) Find the sum of the digits of the least common multiple of 882 and 1225.

a. 9 b. 10 c. 17 d. 18 e. NOTA

8) Find the remainder when $12x^2 + 16x + 6$ is divided by $3x + 1$.

a. 1 b. 2 c. 3 d. 4 e. NOTA

9) Find the degree of this polynomial: $-3x^3y + 8xy^7 - 4xy^8z$.

a. 8 b. 10 c. 18 d. 22 e. NOTA

10) Simplify the following: $\dfrac{\frac{1}{3}+\frac{2}{5}+\frac{x}{2}}{\frac{x}{5}+\frac{2}{3}}$.

a. $\dfrac{7x+11}{3x+10}$ b. $\dfrac{x+3}{2x+4}$ c. $\dfrac{15x+22}{6x+20}$ d. $\dfrac{2}{30x+10}$ e. NOTA

11) Solve for x, $\dfrac{6}{x-5}=\dfrac{x-25}{x^2-5x}$.

a. -5 b. 0 c. 5 d. $\varnothing$ e. NOTA

12) It takes one student 8 minutes to solve a certain word problem and a second student can do the same problem in 6 minutes. How long, in minutes, would it take these 2 students to do the problem together.

a. 3 b. 13/4 c. 7/2 d. 4 e. NOTA

13) Simplify: $\dfrac{1+\sqrt{5}}{3-\sqrt{5}}$.

a. $2+\sqrt{5}$ b. $3+\sqrt{5}$ c. $2+2\sqrt{5}$ d. $2+4\sqrt{5}$ e. NOTA

14) Simplify: $\sqrt{-9}\sqrt{-4}$.

a. -36 b. -6 c. 6 d. 36 e. NOTA

15) Pick the appropriate answer for the following system of equations:

$\begin{cases} 5x-14=3y \\ 6y-10x=-8 \end{cases}$

I. CONSISTENT II. INCONSISTENT

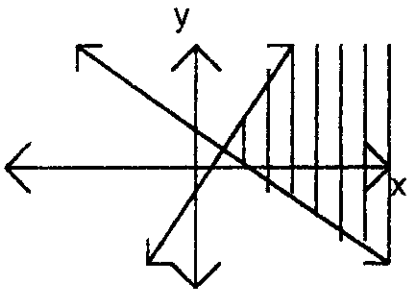
III. DEPENDENT IV. INDEPENDENT

a. I & II only b. II & III only c. I & IV only d. II only e. NOTA

16) Find the sum of the solutions of the following system: $\begin{cases} x-7=-y-z \\ z=1 \\ x+z=y+3 \end{cases}$.

a. 4 b. 5 c. 7 d. 11 e. NOTA

17) The following graph best describes which of the following systems.



a. $\begin{cases} y \geq 2x+3 \\ x+y \leq 3 \end{cases}$ b. $\begin{cases} y \leq 3x+7 \\ x-3y \geq 9 \end{cases}$ c. $\begin{cases} y \geq 2x-1 \\ y+x \geq 3 \end{cases}$ d. $\begin{cases} y \leq 2x-1 \\ x+y \geq 3 \end{cases}$ e. NOTA

18) A certain Math Competition has a cost of $4 per student and has a full attendance at 400 students. The **MAθ** estimates that the number of students would decrease by 50 for each $1 increase in the cost per student. What is the most profitable price for **MAθ** to charge the students?

a. $4 b. $5 c. $6 d. $7 e. NOTA

19) Factor Completely: $x^3+2x-3x^2$.

a. $x(x+2)(x-1)$
b. $(x^2-2x)(x+1)$
c. $x(x-2)(x+1)$
d. $x(x-2)(x-1)$
e. NOTA

20) Find the sum of the solutions of $\frac{2}{x}+\frac{4}{x+4}=1$.

a. 0 b. 2 c. 4 d. 6 e. NOTA

21) Find the sum of all of the solutions for $\sqrt{4-x}+\sqrt{x+6}=4$

a. -2 b. 0 c. 3 d. 8 e. NOTA

22) Find the positive solutions for $\frac{x+2}{x^2+4x+3}-\frac{1}{2x+1}=0$.

a. $\frac{2-\sqrt{5}}{2}$ b. 1/2 c. 3/4 d. $\frac{1+2\sqrt{5}}{2}$ e. NOTA

23) Find the coefficient of the 6th term of the descending order, with respect to x, for $(2x-3y)^8$.

a. -108864 b. -16128 c. -11664 d. -13378 e. NOTA

24) A new building is to be designed so that the width of its rectangular floor is three-fourths its length. Also, If the new building were to be enlarged later, increasing its length by twenty feet and its width by ten feet, it would double the floor area. Find the area of the original new building.

a. 900 $\mathbf{ft}^2$ b. 1200 $\mathbf{ft}^2$ c. 1500 $\mathbf{ft}^2$ d. 1800 $\mathbf{ft}^2$ e. NOTA

25) Simplify: $\left(\mathbf{x}^{\sqrt{3}}\right)^{\sqrt{27}}$.

a. $\mathbf{x}^3$ b. $\mathbf{x}^6$ c. $\mathbf{x}^9$ d. $\mathbf{x}^{12}$ e. NOTA

26) The two shortest sides of a right triangle have lengths of 5 and 12, find the sum of the possible values which could be the hypotenuse.

a. 13 b. 17 c. 30 d. 45 e. NOTA

27) Find the slope of the line that is perpendicular to $3x - 4y = 11$ and also goes through the point (7, 1).

a. -3 b. -4/3 c. -3/4 d. 3/4 e. NOTA

28) Find the sum of the degrees of all of the monomials of the expanded form of $(\mathbf{x}+\mathbf{y})^7$.

a. 7 b. 14 c. 49 d. 56 e. NOTA

29) Find the area of the triangle whose vertices are determined by the graphs of $2x + y = 5$, $y = x - 4$, and $y = 5$.

a. 12 b. 21 c. 27 d. 35 e. NOTA

30) Solve for Z : $\begin{cases} \mathbf{x}-2\mathbf{y}=0 \\ \mathbf{x}-9-\mathbf{y}=-\mathbf{z} \\ \mathbf{x}+8=2\mathbf{z}+3\mathbf{y} \end{cases}$

a. -2 b. -1 c. 3 d. 4 e. NOTA