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DIRECTIONS: Select the best answer from the choices given. If the answer does not appear, use E - N.O.T.A. (None of the above)

1. If $ax + b - y = 0$, then $b =$

   A) $y - ax$ B) $y + ax$ C) $ax - y$ D) $\frac{y}{ax}$ E) N.O.T.A.

2. Find the remainder when $(4x^2 - 5x - 7)$ is divided by $(x - 2)$

   A) 0 B) 1 C) -1 D) 7 E) N.O.T.A

3. If $\langle x|y \rangle = x + xy + y$ for all numbers x and y, what is the value of z if $\langle 8|z \rangle = 3$

   A) -5 B) $-\frac{5}{9}$ C) $\frac{3}{8}$ D) $\frac{5}{9}$ E) N.O.T.A

4. If the taxi fare is ***c*** cents for the first mile and ***s*** cents for each additional quarter-mile, what is the charge, in cents, for a trip of ***x*** miles, where x is greater than 1.

   A) $(c - 1)s + x$ B) $c + 4s(x - 1)$ C) $c + sx$

   D) $c + s(4x - 1)$ E) N.O.T.A.

5. Given $\begin{cases} 4x - 5y = -19 \\ 3x + 7y = 18 \end{cases}$ find the value of $x - y$

   A) 2 B) -2 C) 4 D) -4 E) N.O.T.A.

6. Which of the following is "closed" for the set of rational integers?

   A) $3x + 2 = 7$ B) $x^2 = 24$ C) $\frac{1}{2}(5x + 6) = -7$ D) $x^2 + 2x = -5$

7. Solve: $\frac{x - 2}{3} + \frac{x + 1}{4} = \frac{1}{6}$

   A) 1 B) -1 C) $\frac{1}{7}$ D) $-\frac{1}{7}$ E) N.O.T.A.

8. Solve: $2|x + 5| + 4|x + 5| = -10$

   A) $x = -9$ or $x = 1$ B) $x = 9$ or $x = -1$ C) $x = 21$ or $x = -11$
   D) $x = -21$ or $x = 11$ E) N.O.T.A

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9. Suppose you throw a baseball into the air from the top of a cliff. The intial upward veolcity is 35 m/sec. How long will it take for the ball to hit the ground 40 meters below where it was thrown?

vertical motion formula: $d = rt - 5t^2$

A) 1 sec. B) 5 sec C) 7 sec. D) 8 sec. E. N.O.T.A

10. Patrick's age is 70% of Andrew's age. Four years ago Andrew was 1.6 times as old as Patrick was then. What are their ages now?

A) Patrick = 20, Andrew = 14 B) Patrick = 14, Andrew = 20 C) Patrick = 30, Andrew = 21

D) Patrick = 21, Andrew = 30 E. N.O.T.A.

11. A mixture of 17 parts of brass, 3 parts of copper, and 4 parts of nickel weighs 72 ounces. How many ounces of nickel are in this mixture?

A) 3.4 B) 9 C) 12 D) 17 E) N.O.T.A.

12. If ***n*** and ***p*** are both odd numbers, which of the following numbers MUST be an even number?

A) $n + p + 1$ B) np C) $n + p$ D) $np + 2$ E) N.O.T.A.

13. If $a < b$ and $c < d$, then:

A) $c + a < d + b$ B) $c + a > d + b$ C) $c = b$

D) $a = b$ E) N.O.T.A.

14. If $\begin{vmatrix} w & x \\ y & z \end{vmatrix}$ is defined as $wy - xz$, and $\begin{vmatrix} w & x \\ y & z \end{vmatrix} + K = 0$, then K = ?

A) wy - xz B) xz + wy C) -xz D) xz - wy E) N.O.T.A.

15. If I can purchase 2 items for ***c*** cents, at the same rate, how many items will I receive for ***x*** cents?

A) $\frac{c}{2x}$ B) $\frac{2x}{c}$ C) $\frac{2c}{x}$ D) $\frac{cx}{2}$ E) N.O.T.A.

16. Simplify: $8\sqrt{27} - 6\sqrt{24} + 2\sqrt{75} + \sqrt{54}$

A) $25\sqrt{2}$ B) $34\sqrt{3} - 9\sqrt{6}$ C) $14\sqrt{3} + 15\sqrt{6}$
D) $9\sqrt{6} - 34\sqrt{3}$ E) N.O.T.A.

17. If one of the endpoints of a line segment is (-3, 5) and the midpoint is (4, 1) the other endpoints would be?

A) (11, -3) B) (7 - 4) C) (-7, -4) D) (-11, 3) E) N.O.T.A.

18. If the slope of the line passing thru (4, -5) and (K, - 7) is perpendicular to a line with the slope of $-\frac{1}{2}$ than the value of K is?

A) 2 B) - 2 C) 3 D) - 3 E) N. O. T. A.

19. If $\frac{5x - 4y}{3} = 7$, then y =

A) $\frac{7 - 5x}{12}$ B) $\frac{21 + 5x}{4}$ C) $\frac{21 - 5x}{4}$ D) $\frac{5x - 21}{4}$

20. $\sqrt{x^2y^2 + x^3y^4} = 3xy$, then xy^2 =

A) $\frac{3}{2}$ B) 4 C) 8 D) 16 E) N.O.T.A.

21. A train leaves Transylvania Station at 8:00 A.M. and travels eastward at a rate of 25 miles per hour. Two hours later another train leaves the station, traveling westward at a rate of 35 miles per hour. At what time will the trains be 370 miles apart?

A) 3:33 P.M. B) 3:20 P.M. C) 1:33 P.M. D) 1:20 P.M. E) N.O.T.A.

22. If $\frac{3x^2 + 4x + 6}{x^2 + 3x + 7} = 3$, then x =

A) -3 B) -1 C) 0 D) No real solution E) N.O.T.A.

23. $\frac{a+b}{b}$ =

A) a B) $\frac{a}{b} + b$ C) $a^2 + 1$ D) a + 1 E) N.O.T.A.

24. The slope of a line perpendicular to y = 4 is,

A) 0 B) -4 C) $-\frac{1}{4}$ D) undefined E) N.O.T.A.

25. The baseball team is selling boxes of grapefruit for $8 per box. Thomas sells 24 boxes per hour. Fred sells 6 boxes per hour. Casie sells 14 boxes per hour. Fred starts selling at 8:00 A.M., Casie starts selling at 9:00 A.M., and Thomas begins at 2:00 P.M. They will sell until practice later that day. What time is practice if they raised $3224?

A) 8:45 P.M. B) 7:30 P.M. C) 12:45 P.M. D) 1:15 P.M. E) N.O.T.A.

26. The measure of an angle is represented by the expression 5x -35, for what values of x will the angle be an obtuse angle?

A) 7< x< 18 B) 25 < x < 43 C) x > 23 D) x < 43 E) N.O.T.A

27. The statement ***if a = b and b = c, then a = c*** represents what property?

A) reflexive B) symmetric C) transivitive
D) Commutative E) N.O.T.A.

28. Evaluate f(g(a + 1)), if f(x) = 2x - 11, $g(x) = x^2 - 4$, a = -3.

A) -1 B) -11 C) 285 D) 221 E) N.O.T.A

29. Find all the real numbers x such that $x \neq 1$

$x^{x^3 - 2x^2 - 15x} = 1$

A) {-3, 0 , 5} B) {0 , 3, 5} C) {-5, 0, 3} D) { -5, -3, 0} E) N.O.T.A.

30. Consider the set of positive integers that are less than 20. What is the probability of picking a number that is a composite number?

A) 1 B) $\frac{1}{2}$ C) $\frac{2}{5}$ D) $\frac{4}{5}$ E) N.O.T.A