

Directions : Select the best answer from the choices given. If the answer does not appear, use E, NOTA, None of these answers.

1) Simplify. $3 \cdot 8 + 12 \div 6 \cdot -3 - 20$

- A) -38 B) -2 C) -22 D) -50 E) NOTA

2) Evaluate if $a = 5$, $b = -4$, and $c = 10$.

$$\frac{5(a^2 - b^2)}{c^2 - 2a}$$

- A) 2.2777... B) 2.7333... C) 2 D) 0.5 E) NOTA

3) Which answer best describes the shape of the graph of $y = |x|$?

- A) the letter "V" B) the letter "X" C) a line
D) a parabola E) NOTA

4) Describe the nature of the solutions for the equation $8x^2 - 5x + 2 = 0$.

- A) Two real solutions B) One real solution
C) Two rational solutions D) Two non-real solutions
E) NOTA

5) Jesse, a diver, follows the path when diving from a platform determined by the equation $d = -5t^2 + 10t + 5$, where d is the distance in meters above the water and t is the time in seconds from the beginning of Jesse's dive. Approximately how many seconds does it take for Jesse to enter the water?

- A) 5 B) 0.4 C) 2.4 D) 3 E) NOTA

6) Which property allows you to multiply both sides of an equation by the same non-zero number without affecting the solutions?

- A) Distributive Property of Multiplication over Addition
- B) Multiplicative Identity
- C) Commutative Property of Multiplication
- D) Multiplication Property of Equality
- E) NOTA

7) A test has m multiple-choice questions and t true-false questions. If multiple-choice questions are worth 7 points each and the true-false questions are worth 2 points each, the test will be worth a total of 185 points. If multiple-choice and true-false questions are all worth 4 points apiece, the test will be worth a total of 200 points. Find m and t .

- A) $m = 33, t = 17$
- B) $m = 26, t = 50$
- C) $m = 17, t = 33$
- D) $m = 243, t = -43$
- E) NOTA

8) In December 1986, Jeana Yeager and Dick Rutan flew the *Voyager* airplane nonstop around the world without refueling. The average rate for the 24,987 mile trip was 116 mph. Approximately how many days did it take to make the journey?

- A) 215
- B) 1041
- C) 9
- D) 69563808
- E) NOTA

9) Rationalize.

$$\frac{7}{6 - \sqrt{8}}$$

- A) $\frac{3 + \sqrt{2}}{2}$
- B) $\frac{3 - \sqrt{2}}{2}$
- C) $-7\sqrt{2}$
- D) $7\sqrt{2}$
- E) NOTA

10) Simplify, leaving no variables in the denominator.

$$\left(\frac{4a^{-200} b^{400} c^{-500} d^0}{8a^{-600} b^{-600} c^{100} e^{-200}} \right)^{-1}$$

A) $\frac{a^{400} b^{1000} c^{-600} e^{200}}{2}$

B) $2a^{-400} b^{-1000} c^{600} e^{-200}$

C) $-4a^{800} b^{-1000} c^{600} e^{-200}$

D) $\frac{-a^{800} b^{200} c^{400} e^{200}}{4}$

E) NOTA

11) Multiply. $(ab^x + 3)(ab^x - 3)$

A) $2ab^x - 9$

B) $ab^{2x} - 9$

C) $a^2 b^{2x} - 9$

D) $2ab^{2x} - 9$

E) NOTA

12) Kacie must make at least a B (85%) in Algebra I this grading period in order to be able to get her driver's license. Well, as luck would have it, Kacie broke up with her boyfriend during the grading period. Still upset over the break-up, Kacie has only an 82% average after three tests with only one test remaining. What grade must Kacie get on the last test in order to get the B average she wants?

A) 88%

B) 85%

C) 94%

D) 92%

E) NOTA

13) At Richards Middle School, eighth grade intramural participation is as follows : 120 students play basketball, 165 students play soccer, 125 students play volleyball, 55 students play both basketball and soccer, 45 students play both basketball and volleyball, 65 students play both soccer and volleyball, 30 students play all three sports, and 20 students participate in no sport. Find the number of eighth grade students who attend Richards Middle School.

- A) 625 B) 195 C) 275 D) 295 E) NOTA

14) If $a * b = 2a^2 - b^3$, then $146 * (2 * -3) =$

- A) -243 B) 42848 C) 41543 D) 85507 E) NOTA

15) Nicole has many red, white, and blue marbles in a hat. The ratio of red to white to blue marbles is 4:3:2. What is the probability that Nicole draws out, at random, a red marble from her hat?

- A) $\frac{4}{9}$ B) $\frac{4}{7}$ C) $\frac{4}{6}$ D) $\frac{4}{13}$ E) NOTA

16) $\frac{3}{x} + \frac{6}{y} = 1$ Find $y - x$

$$\frac{3}{x} + \frac{7}{y} = 2$$

- A) $\frac{8}{3}$ B) $\frac{14}{39}$ C) $\frac{8}{5}$ D) $\frac{182}{15}$ E) NOTA

17) Find the equation of the line through the point (4, -5) and parallel to $5x - 10y = 12$.

- A) $x - 2y = 14$ B) $2x - y = 14$
 C) $2x - y = 13$ D) $x - 2y = 13$ E) NOTA

18) A number when added to five times itself equals $\frac{9}{4}$.

Find the reciprocal of the number.

- A) $\frac{3}{8}$ B) $\frac{8}{3}$ C) $\frac{3\sqrt{5}}{10}$ D) $\frac{-3\sqrt{5}}{10}$ E) NOTA

19) Find the remainder when $x^3 + 5x^2 - 20$ is divided by $x + 3$.

- A) -26 B) 4 C) 52 D) -2 E) NOTA

20) Find the value of c so that the line containing the points $(c, 5)$ and $(-4, c)$ has a slope of $\frac{3}{4}$.

- A) -31 B) 8 C) $\frac{8}{7}$ D) -8 E) NOTA

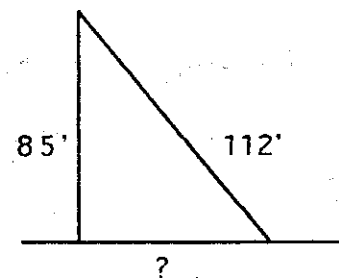
21) Jack can mow the hill in 5 hours if he works alone. Jill can mow the same hill in 4 hours if she works alone. Jack had already been mowing the hill alone for 3 hours when Jill joined him after she fetched a pail of water. How long did Jack and Jill work together in order to finish mowing the hill?

- A) $2\frac{2}{9}$ hours B) $\frac{8}{9}$ of an hour C) 1 hour
D) $\frac{1}{9}$ of an hour E) NOTA

22) Express the decimal $0.63444\dots$ as a fraction in lowest terms with both numerator and denominator as integers.

- A) $\frac{634}{999}$ B) $\frac{571}{999}$ C) $\frac{317}{500}$ D) $\frac{571}{900}$ E) NOTA

23) A telephone pole, 85 feet tall, has a guide wire attached to its top. The guide wire is secured to the ground and is 112 feet long. About how far is the telephone pole from the guide wire along the ground?



- A) 141' B) 19769' C) 5319' D) 73' E) NOTA

24) Stephanie is trying to blow up her Chemistry lab (just kidding!). She has 40 milliliters of 60% H_2SO_4 . How many milliliters of pure H_2SO_4 should Stephanie add to the original amount to make a mixture which is 75% H_2SO_4 ?

- A) 15 B) 24 C) 37 D) 6 E) NOTA

25) A triangle is formed by the equations $y = -3$, $y = \frac{-5}{2}x + 7$, and $y = \frac{5}{2}x + 7$. Find the area of the triangle formed by the equations.

- A) 80 B) 21 C) 40 D) 10 E) NOTA

26) If $64^x = 8$ and $y = 128^{2/7}$, find xy .

- A) 8.168 B) 2 C) 1170.286 D) 8192 E) NOTA

27) For what values of x is the following equation undefined?

$$y = \frac{x^2 - 3x - 4}{x^2 + 5x + 4}$$

- A) $\{-1\}$ B) $\{-1, 4\}$ C) $\{-4\}$ D) $\{-1, -4\}$ E) NOTA