

For all questions, answer choice (E) NOTA means that none of the given answers is correct. Good Luck!

- What is the y -intercept of the line $15x + 8y = 64$?
 (A) $\frac{64}{15}$ (B) 8 (C) 15 (D) 12 (E) NOTA
- Let x and y be real numbers such that $x + y = 4$, $2x + y = 7$. Find xy .
 (A) 6 (B) -5 (C) 4 (D) 3 (E) NOTA
- What is the point-slope form of an equation for a line that passes through $(2, 9)$ with a slope of 4?
 (A) $y = 4x + 1$ (B) $y - 9 = 4(x - 2)$ (C) $y = 4x - 17$ (D) $y + 9 = 4(x - 2)$ (E) NOTA
- Express $\overline{.35}$ as a fraction in simplest form.
 (A) $\frac{7}{18}$ (B) $\frac{7}{20}$ (C) $\frac{35}{99}$ (D) $\frac{35}{81}$ (E) NOTA
- What is the slope-intercept form of an equation for a line that passes through $(1, 6)$ and is parallel to the graph of $y = -7x + 15$?
 (A) $y + 6 = 7(x - 1)$ (B) $y = 7x - 13$ (C) $y - 6 = 7(x + 1)$ (D) $y = -7x + 13$ (E) NOTA
- If $\frac{x - y}{x + y} = 7$ (for $x \neq -y$), what is the ratio of y to x ?
 (A) $-\frac{4}{3}$ (B) $\frac{4}{3}$ (C) $-\frac{3}{4}$ (D) $\frac{3}{4}$ (E) NOTA
- What is the degree of the polynomial $21x^3y^8 + 13x^4y^2z^{-3} - 7x^4y^9 + 12x^8y^5z$?
 (A) 11 (B) 12 (C) 13 (D) 14 (E) NOTA
- Which property of multiplication is shown here: $xyz = yxz$?
 (A) Distributive (B) Associative (C) Symmetric (D) Commutative (E) NOTA
- Rationalize the denominator: $\frac{3}{5 - \sqrt{13}}$.
 (A) $\frac{5 + \sqrt{13}}{4}$ (B) $\frac{5 + \sqrt{13}}{12}$ (C) $\frac{1}{6}$ (D) $\frac{5 - \sqrt{13}}{18}$ (E) NOTA
- Find the sum of the coordinates of the solution of:

$$\begin{aligned} 17x + 31y &= 274 \\ 7x - 5y &= 24 \end{aligned}$$
 (A) 6 (B) 8 (C) 10 (D) 12 (E) NOTA
- If $f(x) = \sqrt{2x - 4}$, find $\frac{1}{f(34)}$.
 (A) 8 (B) 6 (C) $\frac{1}{8}$ (D) $\frac{1}{6}$ (E) NOTA

12. There are 200 students in the Rickards sports club. 64 students play soccer, 44 students play tennis, and 54 students play basketball. 18 students play soccer and tennis, 22 kids play soccer and basketball, and 14 students play tennis and basketball, and 6 students play soccer, tennis, and basketball. How many students are in the Rickards sports club, but do not play any of the mentioned sports?
- (A) 114 (B) 38 (C) 162 (D) 86 (E) NOTA
13. Find the sum of the x -intercepts and the y -intercept of $y = 4x^2 + 6x - 18$.
- (A) $\frac{5}{2}$ (B) $-\frac{27}{2}$ (C) $-\frac{39}{2}$ (D) $-\frac{45}{2}$ (E) NOTA
14. Rachel can row upstream at 2 mph and downstream at 8 mph. She started rowing upstream until she got tired and then she rowed downstream back to her original starting point. How many miles did Rachel row if the entire trip took 2 hours?
- (A) 1.6 (B) 3.2 (C) 6.4 (D) 12.8 (E) NOTA
15. Bessie is going grocery shopping. He needs to buy oranges and watermelons. 3 oranges and 2 watermelons will cost Bessie \$6.90. 9 oranges and 4 watermelons will cost Bessie \$17.70. What is the cost, in dollars, of 7 oranges?
- (A) \$8.40 (B) \$9.80 (C) \$9.10 (D) \$7.70 (E) NOTA
16. In the morning Monica cooks 200 pancakes at a rate of 15 pancakes per hour. In the evening, Monica cooks 200 pancakes at a rate of 30 pancakes per hour. In pancakes per hour, what was Monica's average rate of cooking for the day?
- (A) 22.5 (B) 25 (C) 20 (D) 28 (E) NOTA
17. If $|8 + 7x| \geq 4$, what is the set of all x values that satisfy the equation?
- (A) $\left(-\infty, -\frac{4}{7}\right) \cup \left[\frac{12}{7}, \infty\right]$ (B) $\left[-\frac{12}{7}, -\frac{4}{7}\right]$ (C) $\left[-\frac{4}{7}, \infty\right]$ (D) $\left[-\frac{12}{7}, -\frac{4}{7}\right]$ (E) NOTA
18. Ross is trying to find the 73rd term in the following arithmetic sequence: 1, 6, 11, 16... What will the 73rd term be?
- (A) 356 (B) 361 (C) 366 (D) 371 (E) NOTA
19. In how many distinct ways can the letters in the word "PHEOBE" be rearranged?
- (A) 720 (B) 540 (C) 360 (D) 180 (E) NOTA
20. If a and b are integers such that $(a + b\sqrt{2})^2 = 17 + 12\sqrt{2}$, what is the value of $|a + b|$?
- (A) 7 (B) 5 (C) 6 (D) -5 (E) NOTA
21. Walter has 100 liters of 100% acetic acid solution and 100 liters of 10% acetic acid solution. If Walter wants to make 50 liters of 25% acetic acid solution, using only 100% acetic acid solution and 10% acetic acid solution, how many liters of 100% acetic acid solution should he use in his mixture?
- (A) 5 (B) $\frac{19}{3}$ (C) $\frac{25}{3}$ (D) $\frac{91}{20}$ (E) NOTA
22. Ted and Robin are building a desk together. It takes Ted 13 hours to build the desk alone and it takes Robin 7 hours to build it alone. How long will it take for Ted and Robin to build the desk together, in hours?
- (A) $\frac{20}{91}$ (B) $\frac{9}{20}$ (C) $\frac{20}{9}$ (D) $\frac{91}{20}$ (E) NOTA

23. Simplify $\frac{x^3 + 5x^2 + 3x - 9}{x + 3}$ (for $x \neq -3$)
- (A) $(x - 1)(x - 3)$ (B) $(x - 1)(x + 3)$ (C) $(x - 1)(x - 2)$ (D) $(x - 1)(x + 2)$ (E) NOTA

24. Simplify:

$$\frac{\frac{1}{\frac{1}{3} + \frac{3}{4}}}{\frac{\frac{1}{2}}{\frac{1}{12} + \frac{1}{6}}}$$

- (A) $\frac{24}{13}$ (B) $\frac{22}{13}$ (C) $\frac{11}{13}$ (D) $\frac{6}{13}$ (E) NOTA
25. What is the distance between the points (2,11) and (5,8)?
- (A) $\sqrt{3}$ (B) $\sqrt{6}$ (C) 3 (D) 6 (E) NOTA

26. Find the coordinates of the vertex of the parabola.

$$y = 9x^2 + 12x + 3$$

- (A) $\left(\frac{2}{3}, -1\right)$ (B) $\left(-\frac{2}{3}, -1\right)$ (C) $\left(-\frac{3}{2}, 1\right)$ (D) $\left(\frac{2}{3}, 1\right)$ (E) NOTA
27. What is 432_5 converted to base 8?
- (A) 117 (B) 165 (C) 585 (D) 911 (E) NOTA

28. If nine workers can call nine people in nine seconds, then how many second(s) would it take 109 workers to call 109 people?

- (A) 9 (B) 1 (C) 12.1 (D) 109 (E) NOTA
29. Find the sum of the reciprocals of the roots to the following equation: $x^2 - 70x + 825 = 0$.
- (A) 70 (B) -70 (C) $-\frac{14}{165}$ (D) $\frac{14}{165}$ (E) NOTA
30. Find the sum of the integers that satisfy the inequality: $7 < |3x + 4| < 29$.
- (A) -16 (B) -15 (C) -13 (D) -14 (E) NOTA