

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

- Evaluate $1 - 2 + 3 - 4 + \dots + 45 - 46$.
(A) -24 (B) -23 (C) -44 (D) -46 (E) NOTA
- If $1 \leq 2x - 7 \leq 8$, then which of the following represents the range of values for x ?
(A) $4 < x < \frac{15}{2}$ (B) $\frac{15}{2} \leq x \leq 11$ (C) $\frac{15}{2} < x < 11$ (D) $4 \leq x \leq \frac{15}{2}$ (E) NOTA
- The sum of 3 consecutive even integers is equal to 1 more than the 9th prime number. What is the smallest number?
(A) 6 (B) 8 (C) 4 (D) 10 (E) NOTA
- Given that $f(x) = 16x + 9$, find $f(4) - f(1)$.
(A) 48 (B) 98 (C) 57 (D) 66 (E) NOTA
- Zayn is drawing a miniature version of a painting. If the original painting has width 21" and height 30" the scale used is $1.5 \text{ cm} = 1 \text{ inch}$, what are the dimensions of his drawing (height \times width, in cm)?
(A) 14×20 (B) 20×14 (C) 45×31.5 (D) 31.5×45 (E) NOTA
- A right triangle has sides of length 6 and 8. What is the length of the third side?
(A) $2\sqrt{6}$ (B) 10 (C) $4\sqrt{6}$ (D) 12 (E) NOTA
- Given the set of numbers $\{1, 2, 3, 4, 4, 6, 8\}$, calculate the sum of the mean, median, and mode.
(A) 11 (B) 13 (C) 16 (D) 12 (E) NOTA
- The weather man declares that there is a $\frac{3}{5}$ chance of rain tomorrow. What is this expressed as a percentage?
(A) 30% (B) 80% (C) 60% (D) 75% (E) NOTA
- The number $1.\overline{51}$ can be expressed as $\frac{A}{B}$, where $\frac{A}{B}$ is in simplest form. What is $A + B$?
(A) 249 (B) 50 (C) 83 (D) 150 (E) NOTA
- Simplify $\frac{x^2 + 5x - 24}{x^2 + 13x + 40}$, where defined.
(A) $\frac{x - 3}{x + 5}$ (B) $\frac{x + 3}{x - 5}$ (C) $x + 8$ (D) $x - 8$ (E) NOTA

11. Louis is 3 years older than twice Harry's age. Two years ago, Louis was $\frac{5}{2}$ of Harry's age two years ago. What is the sum of their ages now?
- (A) 59 (B) 39 (C) 35 (D) 63 (E) NOTA
12. Find the point at which the perpendicular bisector (cuts the segment in half at a right angle) of the segment connecting $(5, 12)$ and $(-1, -2)$ intersects the x -axis.
- (A) $(14, 0)$ (B) $\left(\frac{41}{7}, 0\right)$ (C) $\left(\frac{1}{3}, 0\right)$ (D) $\left(\frac{41}{3}, 0\right)$ (E) NOTA
13. Kavitha really wants a test average of at least 95 in her chemistry class. Her scores so far are 96, 94, 99, and 85. The only test left is the final exam, which counts twice as much as a normal test does. What is the lowest score she can get on the final and still meet her goal?
- (A) 96 (B) 98 (C) 95 (D) 101 (E) NOTA
14. Let $\Delta(x, y) = x^2 + xy + y$. Find $\Delta(4, \Delta(2, -1))$.
- (A) 20 (B) 16 (C) 26 (D) 11 (E) NOTA
15. It takes Andrew 1 day to paint a house, and it takes Ian 2 days to paint a house. Andrew and Ian start painting a house at 8 AM. They take a one hour break for lunch at 12 PM. What time will they finish painting?
- (A) 1 AM (B) 12 AM (C) 8 PM (D) 12 PM (E) NOTA
16. Annie has $2x + 7$ pieces of candy. Nidhi has $x^2 + 9x + 3$ pieces, but her little brother asks for $3x$ pieces. Being the nice sister that Nidhi is, Nidhi gives him $3x + 1$ pieces. Now, Annie and Nidhi have the same number of pieces. How many pieces did Nidhi give her brother?
- (A) 17 (B) 16 (C) 4 (D) 9 (E) NOTA
17. How many distinct ways are there to arrange 6 people in a line, if 2 of them must stand next to each other?
- (A) 720 (B) 24 (C) 480 (D) 120 (E) NOTA
18. The probability that Andy gets a question right is $\frac{4}{5}$. The probability that Josh gets a question right is $\frac{2}{3}$. Given any question, what is the probability that they both get it wrong?
- (A) $\frac{8}{15}$ (B) $\frac{2}{15}$ (C) $\frac{4}{15}$ (D) $\frac{1}{15}$ (E) NOTA
19. Using the information from the previous question, what is the probability that at least one of the boys gets the question correct?
- (A) $\frac{14}{15}$ (B) $\frac{13}{15}$ (C) $\frac{7}{15}$ (D) 1 (E) NOTA

20. Lindsay has a solution weighing 12 ounces that is 45% sugar. However, she needs a 75% sugar solution. How many ounces of pure sugar does she need to add to her original solution?
(A) 9 (B) 14.4 (C) 3.6 (D) 10.8 (E) NOTA
21. $f(x) = 3x + 5$ and $g(x) = -2x - 1$. For what value of x does $f(g(x)) = -10$?
(A) -1 (B) 2 (C) -14 (D) $-\frac{1}{6}$ (E) NOTA
22. What is the second smallest positive integer that has exactly 5 positive factors?
(A) 32 (B) 16 (C) 81 (D) 24 (E) NOTA
23. Which of the following is not equivalent to the others?
(A) $4(2x - 3)$ (B) $2x + 6(x - 2)$ (C) $8(x - 1) - 4$ (D) $2(4x - 3) + 6$ (E) NOTA
24. Find the value of n that makes the two lines parallel.
$$\begin{cases} 2x - ny = -17 \\ -5x + 3y = 103 \end{cases}$$

(A) $\frac{6}{5}$ (B) $-\frac{6}{5}$ (C) $\frac{5}{6}$ (D) $\frac{5}{3}$ (E) NOTA
25. Find the greatest common factor of $18x^2yz^3$, $45x^4z$, and $15x^2y^5z^2$.
(A) $9x^2z$ (B) $90x^4y^5z^3$ (C) $9x^2z^2$ (D) $3x^2z$ (E) NOTA
26. Find the units digit of 3^{2012} .
(A) 1 (B) 3 (C) 7 (D) 9 (E) NOTA
27. Liam has an infinite amount of coins worth 7 cents and 3 cents. What is the largest amount of money that he cannot pay for in exact change?
(A) 9 (B) 11 (C) 12 (D) 8 (E) NOTA
28. Niall rides his bike at a constant rate of 30 miles per hour. If he rides his bike for 10 minutes, and the circumference of his wheel is 0.001 miles, how many full rotations does his bike wheel make?
(A) 1,000 (B) 10,000 (C) 5,000 (D) 500 (E) NOTA
29. Given that $x + y = 6$ and $xy = 4$, what is the value of $x^3 + y^3$?
(A) 108 (B) $8\sqrt{2} + 8\sqrt{3}$ (C) 144 (D) $\frac{1250}{64}$ (E) NOTA
30. Evaluate: $-1 + (2(3) - (-4))^2 - 6$.
(A) 3 (B) 105 (C) 95 (D) -3 (E) NOTA