

Select (E) NOTA if none of the above answers are correct. Good luck!

- What is the slope of the line $3x + y = 7$?
(A) 3 (B) -3 (C) 3 (D) $-\frac{3}{7}$ (E) NOTA
- Simplify: $7^7 + 7^7 + 7^7 + 7^7 + 7^7 + 7^7 + 7^7$.
(A) 7^{49} (B) 7^{77} (C) 7^8 (D) 777 (E) NOTA
- Solve the equation for x : $3x - 9 = 2(x + \frac{5}{2})$
(A) 14 (B) 3 (C) 6 (D) 60 (E) NOTA
- The rate at which Matthew runs(mph) is directly proportional to the amount of sushi he has eaten(lbs.) If Matthew runs at 30 mph when he has eaten 72 lbs. of sushi, how fast does Matthew run when he has eaten 36 lbs. of sushi?
(A) 60 mph (B) 15 mph (C) 45 mph (D) 30 mph (E) NOTA
- Compute the sum: $1 + 5 + 9 + \dots + 41$.
(A) 462 (B) 231 (C) 442 (D) 221 (E) NOTA
- The probability that Annie falls asleep in her History class is $\frac{3}{5}$. The probability that she falls asleep in her English class is $\frac{3}{7}$. Both probabilities are independent. What is the probability that Annie falls asleep in both classes?
(A) $\frac{1}{2}$ (B) $\frac{5}{7}$ (C) $\frac{6}{35}$ (D) $\frac{9}{35}$ (E) NOTA
- Find the sum of the distinct real solutions to $3x^2 - 6x + 3 = 0$.
(A) 69 (B) 4 (C) 2 (D) 1 (E) NOTA
- Compute the sum of the positive integral factors of 120.
(A) 648 (B) 360 (C) 120 (D) 210 (E) NOTA
- If $f(x) = 6x + 6$, and $g(x)$ is $6x - 6$, what is $f(g(6))$?
(A) 96 (B) 36 (C) 186 (D) 258 (E) NOTA
- Expand $(2x + 1)(5x + 2)$.
(A) $10x^2 + 9x + 2$ (B) $10x^2 + 5x + 2$ (C) $10x^2 + 4x + 5$ (D) $10x^2 + 20x + 3$ (E) NOTA
- Matthew wants to be the very best. Like no one ever was. He has only two opponents left before he wins the Tournamon Tournament. If the probability that Matthew wins any single Pokemon Trainer Battle is $\frac{2}{3}$, what is the probability that Matthew wins the first battle but loses the second?
(A) $\frac{4}{9}$ (B) $\frac{1}{9}$ (C) $\frac{2}{9}$ (D) $\frac{1}{3}$ (E) NOTA
- If $x \heartsuit y = xy + y + 1$, find $3 \heartsuit (2 \heartsuit 1)$.
(A) 17 (B) 15 (C) 19 (D) 25 (E) NOTA

13. Find the units digit of $1! + 2! + 3! + \dots + 10!$.
 (A) -50 (B) 3 (C) 0 (D) 5 (E) NOTA
14. If the equation $x^2 - 6x + 25 = 0$ has roots e and f , and the equation $x^2 + ax + b = 0$ has roots e^2 and f^2 , find the value of a .
 (A) -14 (B) 14 (C) $\frac{7}{2}$ (D) $-\frac{7}{2}$ (E) NOTA
15. If $x = \sqrt{5 + \sqrt{3}}$ and $y = \sqrt{5 - \sqrt{3}}$, find xy .
 (A) 22 (B) 25 (C) 28 (D) $25 + \sqrt{3}$ (E) NOTA
16. Compute: $(312)(316) - (314)(314)$.
 (A) 314 (B) 312 (C) 4 (D) -4 (E) NOTA
17. Find the remainder when $(3x^3 + 5x^2 + 5)$ is divided by $(x + 3)$.
 (A) 23 (B) 131 (C) 77 (D) -31 (E) NOTA
18. Evaluate: $\frac{6}{1 + \frac{6}{1 + \frac{6}{1 + \frac{6}{1 + \dots}}}}$
 (A) -3 (B) 1 (C) 2 (D) 3 (E) NOTA
19. Given that the y-intercept of a line is $(0, 4)$ and the x-intercept is $(7, 0)$, express the equation of the line in $y = mx + b$ form.
 (A) $y = -\frac{7}{4}x + 7$ (B) $y = -\frac{7}{4}x + 4$ (C) $y = -\frac{4}{7}x + 4$ (D) $y = -\frac{4}{7}x + 7$ (E) NOTA
20. The German soccer club SV Werder Bremen has placed in the top 15 in the Bundesliga soccer league for the past 12 seasons. From 1999 to 2011, they have placed 9th, 7th, 6th, 6th, 1st, 3rd, 2nd, 3rd, 2nd, 10th, 3rd, and 13th respectively. To the nearest whole number, what was SV Werder Bremen's average position in the Bundesliga from 1999 to 2011?
 (A) 4th (B) 5th (C) 6th (D) 7th (E) NOTA
21. If Matthew writes a test in 10 days, and Tommy writes a test in 5 days, how long will it take both Matthew and Tommy to write a test together?
 (A) $\frac{5}{3}$ days (B) $\frac{10}{3}$ days (C) 5 days (D) 9 days (E) NOTA
22. If $(x + 1)(x + 1)(xy) + x + y + 2xy$ can be expressed in the form $Ax^3y + Wx^2y + Sxy + Ox + My$, find the value of $12A - W + S + O + 5M$.
 (A) 19 (B) 8 (C) 33 (D) 31 (E) NOTA
23. How many possible ways can the letters in "RICKARDS" be arranged such that the "I" and the "A" are always next to each other?
 (A) 1080 (B) 540 (C) 1005 (D) 2010 (E) NOTA

24. The repeating decimal $\overline{.45}$ can be written as the fraction $\frac{a}{b}$ where a and b are relatively prime positive integers. Compute $a + b$.
- (A) 144 (B) 16 (C) 5 (D) 9 (E) NOTA
25. At a circus, Matthew sees a group of polar bears and humans. Polar bears have 4 legs and 1 head. Humans have 2 legs and 1 head. Matthew counts 16 total heads and 56 total legs. What is the sum of $\frac{1}{3}$ the amount of Polar bears and $\frac{1}{4}$ the amount of humans?
- (A) 20 (B) 16 (C) 4 (D) 5 (E) NOTA
26. Find the value of $x + y + z$ for the system of equations:
- $$\begin{aligned} 2x + y + z &= 13 \\ x - y + 2z &= 8 \\ 4x - 3z &= 7 \end{aligned}$$
- (A) 9 (B) 3 (C) -3 (D) 10 (E) NOTA
27. Steven rides his bike at the rate of 15 mph. Tommy rides his tricycle at the rate of 25 mph. Steven and Tommy start at the same point but at different times, and travel in the same direction. If Steven starts cycling 5 hours before Tommy, how long will it be before Tommy catches up to Steven? The answers are expressed in **hours**.
- (A) 10 (B) 15 (C) 7.5 (D) 25 (E) NOTA
28. Daniel is hungry and wants to buy some chicken nuggets. What is the largest amount of chicken nuggets that Daniel cannot obtain using only three nugget and five nugget packages assuming that each package cannot be partially filled or empty?
- (A) 22 (B) 17 (C) 4 (D) 7 (E) NOTA
29. If $x_1, x_2, x_3, \dots, x_8$ are the roots of the eighth-degree polynomial, $2x^8 + bx^7 + cx^6 + dx^5 + ex^4 + fx^3 + gx^2 + hx + m$, find the value of b when:
- $$\begin{cases} x_1 + x_2 + x_3 = 6 \\ x_2 + x_3 + x_4 = 18 \\ x_3 + x_4 + x_5 = 9 \\ x_4 + x_5 + x_6 = -3 \\ x_5 + x_6 + x_7 = -9 \\ x_6 + x_7 + x_8 = -6 \\ x_7 + x_8 + x_1 = -2 \\ x_8 + x_1 + x_2 = 2 \end{cases}$$
- (A) 20 (B) -10 (C) 10 (D) -30 (E) NOTA
30. Expand $(2x^3 + 3x^2 + x + 3)^2$.
- (A) $4x^6 + 8x^5 + 8x^4 + 186x^3 + 13x^2 + 6x + 9$
 (B) $4x^6 + 12x^5 + 13x^4 + 18x^3 + 19x^2 + 4x + 9$
 (C) $4x^6 + 12x^5 + 12x^4 + 18x^3 + 18x^2 + 6x + 9$
 (D) $4x^6 + 12x^5 + 13x^4 + 18x^3 + 19x^2 + 6x + 9$
 (E) NOTA