

The choice (E) NOTA means that none of the other answers are correct. Good luck!

- Pokemon Peter needs to add 2 to some number to obtain P . Jiarraqi the legendary Pokemon must multiply the same number by 7.5 to obtain 30. What is P ?
(A) 4 (B) 6 (C) 225 (D) 227 (E) NOTA
- Evaluate $f(3)$, given that $f(x) = 5x + 7$.
(A) $\frac{-4}{5}$ (B) 22 (C) 38 (D) 85 (E) NOTA
- Simplify the expression $2009(2009^{2008})$.
(A) 2009! (B) $2009^{4034072}$ (C) 4034072^{2009} (D) 2009^{2009} (E) NOTA
- Find the sum of the solutions of the equation $|x + 3| = 7$.
(A) -10 (B) -6 (C) 0 (D) 4 (E) NOTA
- It takes 4 seconds for Sathwik to eat a pan of pizza, Ian 6 seconds to eat a pan of pizza, and Parth 12 seconds to eat a pan of pizza. How long does it take for all three of them to eat a pan of pizza if they eat it together?
(A) $\frac{1}{2}$ seconds (B) 2 seconds (C) 3 seconds (D) 22 seconds (E) NOTA
- Evaluate the infinite sum $\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \dots$
(A) $\frac{1}{2}$ (B) $\frac{2}{3}$ (C) $\frac{3}{4}$ (D) 1 (E) NOTA
- If x , y , and z are real numbers such that $(x - 8)^2 + (y - 4)^2 + (z - 2)^2 = 0$, what is $x + y + z$?
(A) 14 (B) 16 (C) 36 (D) 64 (E) NOTA
- Find the remainder when $(x^4 - x^3 + x^2 + x - 3)$ is divided by $(x + 2)$.
(A) -29 (B) 3 (C) 11 (D) 23 (E) NOTA
- Tarun earned scores of 56, 50, and 52 on his first three mathematics examinations. After studying 3 days and nights, he received a score of x on his 4th mathematics exam. His average for the 4 exams is 50. What is x ?
(A) 42 (B) 44 (C) 46 (D) 48 (E) NOTA

10. Given that $x \neq 3$, simplify the expression $\frac{x^2 - 6x + 9}{x^2 - 9}$.
- (A) $\frac{x+3}{x-3}$ (B) $\frac{x-3}{x+3}$ (C) $\frac{x-6}{x+3}$ (D) $\frac{(x-3)^2}{(x+3)^2}$ (E) NOTA
11. Find the constant term in the binomial expansion of $(3x + \frac{1}{x})^8$.
- (A) 81 (B) 4536 (C) 5670 (D) 6561 (E) NOTA
12. Manfei can't remember the last digit of her friend's phone number. She decides to choose the last digit randomly in an attempt to reach her friend. She only has two tries before her phone will explode. Find the probability she will dial the correct number before this explosion, assuming that she does not guess the same number twice.
- (A) $\frac{1}{10}$ (B) $\frac{19}{100}$ (C) $\frac{1}{5}$ (D) $\frac{1}{90}$ (E) NOTA
13. What is the area of the ellipse with equation $16x^2 + 9y^2 = 144$?
- (A) 6π (B) 12π (C) 25π (D) 144π (E) NOTA
14. Find x given that $\sqrt{2 + \sqrt{x}} = 11$.
- (A) 119 (B) 123 (C) 14161 (D) 15129 (E) NOTA
15. Find the sum of the integral roots of the equation $4x^3 - 12x^2 + 11x - 3 = 0$.
- (A) -3 (B) -1 (C) 1 (D) 3 (E) NOTA
16. Andrew, who lived his entire life in the eighteenth century, was x years old on November 14th in the year x^2 . How old was Andrew on November 14th, 1786?
- (A) 36 (B) 49 (C) 64 (D) 81 (E) NOTA
17. If $A = \begin{pmatrix} 2 & 3 \\ 7 & 9 \end{pmatrix}^{-1}$, what is $|A|$?
- (A) -3 (B) $-\frac{1}{3}$ (C) $\frac{1}{3}$ (D) 3 (E) NOTA
18. If $2(7^2 + 24^2)^5 + 3(15^2 + 20^2)^5 = 5^k$, find k .
- (A) 6 (B) 11 (C) 20 (D) 21 (E) NOTA

19. If a and b are the roots of the polynomial $x^2 + x + 12$, find $a^2 + ab + b^2$.
- (A) -13 (B) -11 (C) 1 (D) 13 (E) NOTA
20. If $(x - a)$ is a factor of $(x^2 + 2ax - 3)$, where a is a real number, find the sum of all values for a .
- (A) -2 (B) -1 (C) 0 (D) 1 (E) NOTA
21. Evaluate $i^{4^{2^2}}$, where $i = \sqrt{-1}$.
- (A) i (B) -1 (C) $-i$ (D) 1 (E) NOTA
22. Find the sum of the x and y coordinates of the vertex of the parabola $y = x^2 + 4x + 4$.
- (A) -4 (B) -2 (C) 0 (D) 2 (E) NOTA
23. Solve for x : $(2x + 3i)(5 + 2i) = 9 + 21i$, where x is a real number and $i = \sqrt{-1}$.
- (A) $\frac{3}{10}$ (B) $\frac{1}{2}$ (C) $\frac{3}{2}$ (D) 9 (E) NOTA
24. Lulubear's watch stops for 15 minutes each time the minute hand reaches 30 minutes. How many actual hours elapse from when the watch shows 12 P.M. (noon) until it shows 12 A.M. (midnight)?
- (A) 12 (B) 15 (C) 15.25 (D) 18 (E) NOTA
25. Simplify $\left(\frac{\log 3}{\log 2} + \frac{\log 9}{\log 4}\right) \left(\frac{\log 4}{\log 3} + \frac{\log 2}{\log 9}\right)$.
- (A) 2 (B) 4 (C) 5 (D) 6 (E) NOTA
26. There are 17 terms in an arithmetic sequence, and the 9th term is 19. What is the sum of the terms of the arithmetic sequence?
- (A) 93 (B) 153 (C) 323 (D) need more info (E) NOTA
27. What is the shortest distance between the line $y = -x + 5$ and the center of the circle with equation $y^2 + 2y + x^2 + 4x - 4 = 0$?
- (A) $\frac{\sqrt{2}}{2}$ (B) $4\sqrt{2}$ (C) $\frac{2\sqrt{5}}{5}$ (D) $\frac{8\sqrt{5}}{5}$ (E) NOTA

28. Find the last two digits of N where $N = 11^{12} - 1$.

- (A) 20 (B) 40 (C) 60 (D) 80 (E) NOTA

29. Identify the graph of $4x^2 + 16x + 9y^2 + 54y + 97 = 0$.

- (A) circle (B) ellipse (C) hyperbola (D) point (E) NOTA

30. Find the product of all solutions to the equation: $\sqrt{\frac{\log \sqrt{3x}}{\log x}} \cdot \frac{\log x}{\log 3} = -1$.

- (A) $\frac{-1}{2}$ (B) $\frac{1}{9}$ (C) $\frac{1}{3}$ (D) 3 (E) NOTA