

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

1. Compute: $1 + 3 + 5 + 7 + 9 + \dots + 49$
(A) 500 (B) 612 (C) 613 (D) 625 (E) NOTA
2. Karthik is very busy this summer and needs to figure out how long it will take him to write this test. It takes him 5 minutes to write one word problem, 2 minutes to write one problem that involves functions, and 4 minutes per question to write all the other questions. Given that this test has 13 word problems, 2 function problems, and 15 other problems, how many minutes will it take him to write this test?
(A) 42 (B) 129 (C) 131 (D) 135 (E) NOTA
3. Solve the inequality: $2 - 3x > 11$
(A) $x > 3$ (B) $x < -3$ (C) $x > -3$ (D) $x \leq -3$ (E) NOTA
4. Jasmine is deciding what she wants to wear for the Rickards Invitational. She must choose between 4 pairs of track shorts, 3 hoodies, and 2 shirts. How many different combinations of outfits can she choose from, given that one outfit consists of one pair of track shorts, one hoodie, and one shirt?
(A) 24 (B) 12 (C) 9 (D) 18 (E) NOTA
5. Where do the equations $y = x$ and $y = x^2 + 7x + 9$ intersect?
(A) No intersection (B) (3,3) (C) (-3,-3) (D) (0,0) (E) NOTA
6. Given that $f(x) = x^3 + 2x^2 + 1$, $g(x) = -x^3 - x^2 - 4x + 4$, $h(x) = f(x) + g(x)$, and $h(x) = 1$, what is the value of x ?
(A) 2 (B) 1 (C) 0 (D) -2 (E) NOTA
7. Evaluate $\sqrt{12 + \sqrt{12 + \sqrt{12 + \dots}}}$
(A) 12 (B) 6 (C) -3 (D) 4 (E) NOTA
8. Let $xy = 16$, $yz = 9$, and $xz = 4$. Given that x , y , and z are positive, what is the value of y ?
(A) 6 (B) 3 (C) 4 (D) $\frac{57}{29}$ (E) NOTA
9. What is the slope of the line going through the two points (3,2) and (7,4)?
(A) $\frac{3}{5}$ (B) -2 (C) 0 (D) $\frac{1}{2}$ (E) NOTA
10. Sid and Karthik are racing. They grab their best running shoes and head to the starting line. The track is 100 ft long and Sid can run at $10 \frac{ft}{sec}$ while Karthik can only run at $9.5 \frac{ft}{sec}$. By how many feet is Sid ahead of Karthik when he crosses the finish line?
(A) 5 (B) 0.5 (C) 1 (D) 2.5 (E) NOTA
11. In the same race mentioned in #10, Karthik continues running after Sid crosses the finish line, until he also passes the finish line. How many seconds will Karthik continue to run after Sid crosses the finish line?
(A) 1 (B) $\frac{1}{2}$ (C) $\frac{10}{19}$ (D) $\frac{2}{19}$ (E) NOTA

12. Solve for x : $6x + 5 - (2x - 4) = 7x - 3(5 - x)$
(A) -3 (B) 3 (C) 4 (D) 6 (E) NOTA
13. Aniketh and Varun are building a fort. Aniketh can build a fort in 3 days while Varun can build one in 2 days. Aniketh starts building the fort alone for one day. The next day, Varun comes and helps build the fort with Aniketh. How many days does it take to finish the fort after Varun arrives?
(A) 1 (B) $\frac{3}{2}$ (C) $\frac{6}{5}$ (D) $\frac{1}{2}$ (E) NOTA
14. Puneet and Rohith are making a bhangra dance team. They have 10 potential candidates but they only need 2 girls and 1 boy. If 6 of the candidates are girls, how many ways can they choose their team?
(A) 15 (B) 30 (C) 36 (D) 60 (E) NOTA
15. What is the equation of the perpendicular bisector of the line segment with endpoints (0,0) and (4,6)?
(A) $y = \frac{3}{2}x + 3$ (B) $y = \frac{3}{2}x + \frac{13}{3}$ (C) $y = \frac{-2}{3}x + 3$ (D) $y = \frac{-2}{3}x + \frac{13}{3}$ (E) NOTA
16. Sohan and Sidhika are shopping together. Sidhika buys 2 pencils and 3 pens for \$3.60. Sohan buys 5 pens and 1 pencil for \$4.60. How much does one pencil and one pen cost?
(A) \$1 (B) \$1.40 (C) \$1.60 (D) \$2 (E) NOTA
17. Anvitha, angry that Sohan bought school supplies without her, begins giving her friends math problems and forcing them to do the problems. If 6 of her friends can do 6 problems in 6 seconds, then how long does it take 12 of her friends to do 12 problems?
(A) 4 seconds (B) 12 seconds (C) 6 seconds (D) 9 seconds (E) NOTA
18. Rida, RJ, and Meit are at a professional arm wrestling competition. The probability that Rida wins a round of arm wrestling is $\frac{9}{10}$. The probability that RJ wins a round is $\frac{2}{10}$, and the probability Meit wins a round is $\frac{3}{10}$. If they each had one round that day (and it was not with each other), what is the probability Meit and RJ win, but Rida loses?
(A) $\frac{7}{10}$ (B) $\frac{27}{500}$ (C) $\frac{3}{500}$ (D) $\frac{3}{50}$ (E) NOTA
19. Given $x^2 + y^2 = 12$, and $xy = 12$, find the positive value of $x + y$.
(A) 0 (B) 3 (C) 6 (D) 9 (E) NOTA
20. Using the same information from the previous question, what is $x^3 + y^3$? (Hint: Use your answer from the previous question)
(A) 0 (B) 3 (C) 6 (D) 9 (E) NOTA
21. The Brotherhood (consisting of 6 members) sit around a circular table with six chairs to discuss their next mission. Two members of the brotherhood, Rohith and Puneet, must sit next to each other. How many ways can they sit around the table?
(A) 36 (B) 48 (C) 84 (D) 120 (E) NOTA

22. What is the degree of the following polynomial?

$$x^3 + y^4z + 3^6$$

- (A) 14 (B) 8 (C) 6 (D) 4 (E) NOTA

23. For some strange reason, Puneet doesn't like coffee. Jasmine tries to convince him to drink some by making cold-brewed coffee. She has 10 cups of 40% coffee but wants to make it stronger. How many cups of 80% coffee solution does she need to make a 50% coffee solution?

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

24. Puneet the pillow pet is on a Cartesian plane (or a regular $x - y$ plane) and is on (3,2). He wants to go to his house on (9,8). What is the length of the shortest path he can take?

- (A) $3\sqrt{2}$ (B) $6\sqrt{2}$ (C) $6\sqrt{3}$ (D) $12\sqrt{2}$ (E) NOTA

25. Given the function $f(x) = x^2 + 6x + 10$, find the minimum value of $f(x)$.

- (A) 2 (B) 1 (C) 0 (D) -1 (E) NOTA

26. Jim is 5 times as old as Kyle. Jim's age 10 years later will be 4 less than 2 times Kyle's age 10 years later. How old is Kyle today?

- (A) 10 (B) 3 (C) 2 (D) 1 (E) NOTA

For problems 27 and 28, use the equation $x^2 + 7x + 9 = 0$ with roots r and s .

27. Find $r^2 + s^2$.

- (A) 67 (B) 49 (C) 40 (D) 31 (E) NOTA

28. Find $\frac{1}{r} + \frac{1}{s}$.

- (A) $\frac{-7}{9}$ (B) -7 (C) $\frac{9}{7}$ (D) 9 (E) NOTA

29. One coo is 125% of one boo. One boo is 125% of one goo. What percent of one coo is one goo?

- (A) 100 (B) 156.25 (C) 64 (D) 80 (E) NOTA

30. Find the number of positive factors of 120.

- (A) 16 (B) 8 (C) 12 (D) 2 (E) NOTA