

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

- Compute the number of distinct arrangements of the letters in the word "SWEDEN."  
 (A) 60 (B) 120 (C) 360 (D) 720 (E) NOTA
- Ian and Ran just bought new rectangular televisions. Ian's television measures 50 inches and Ran's television measures 30 inches (note that the size of a television refers to the length of the diagonal). Given that their televisions are similar, compute the ratio of the area of Ian's television to the area of Ran's television.  
 (A) 5 : 3 (B)  $5\sqrt{2} : 3$  (C) 25 : 9 (D) need more info (E) NOTA
- Chico goes on a 30 minute rant because he missed a math problem. During this rant, 1 person tells him to be quiet during the 1st minute, 2 people tell him to be quiet during the 2nd minute, and so on, until 30 people tell him to be quiet during the 30th minute. How many times is Chico told to be quiet in this 30 minute span?  
 (A) 435 (B) 450 (C) 465 (D) 900 (E) NOTA
- Tarun is playing golf on the coordinate plane. His ball is at the point  $(8, 5)$  and he putts along a straight line toward the point  $(-24, 17)$ . Assuming he makes his putt, which of the following points will the ball **not** pass through?  
 (A)  $\left(\frac{64}{11}, \frac{64}{11}\right)$  (B)  $(-8, 11)$  (C)  $\left(12, \frac{7}{2}\right)$  (D)  $(0, 8)$  (E) NOTA
- Compute the area of a triangle with sides of length 10, 11, and 19.  
 (A) 30 (B)  $30\sqrt{2}$  (C)  $30\sqrt{3}$  (D) 60 (E) NOTA
- Evaluate
 

8 days,	13 hours,	39 minutes,	20 seconds
– 3 days,	20 hours,	47 minutes,	44 seconds

 (A) 4 days, 16 hours, 13 minutes, 16 seconds  
 (B) 4 days, 16 hours, 51 minutes, 16 seconds  
 (C) 4 days, 16 hours, 51 minutes, 36 seconds  
 (D) 12 days, 10 hours, 27 minutes, 4 seconds  
 (E) NOTA
- For the triangle with vertices located at the coordinates  $(2, 3)$ ,  $(5, 7)$ , and  $(-4, 11)$ , the point  $(1, 7)$  is located at which of the following points?  
 (A) Centroid (B) Circumcenter (C) Incenter (D) Orthocenter (E) NOTA
- Let the operator  $\triangle$  be defined as  $a\triangle b = a(b^2 - a)$  for real numbers  $a, b$ . Evaluate  $(3\triangle 2)\triangle(7\triangle 3)$ .  
 (A) 335 (B) 401 (C) 579 (D) 736 (E) NOTA
- Andrew can solve a puzzle in 5 hours while Caleb can solve the same puzzle in 6 hours. Andrew works on the puzzle alone for 1 hour, at which point Caleb then comes to help him. After one hour of working together, Andrew leaves Caleb to work on the puzzle himself. Compute the entire amount of time Caleb had to work on the puzzle. Assume they both work at constant rates.  
 (A)  $\frac{13}{5}$  hours (B)  $\frac{18}{5}$  hours (C)  $\frac{5}{13}$  hours (D) 2 hours (E) NOTA
- A roller coaster track is 3168 feet long. The roller coaster can complete one length of this track in 45 seconds. Assuming the roller coaster travels at a constant rate, compute its speed in miles per hour.  
 (A) 42 (B) 45 (C) 48 (D) 60 (E) NOTA

11. Triangle  $ABC$  has  $\angle A = 30^\circ$  and  $\angle B = 45^\circ$ . Given that  $BC = 2$ , compute the length of the longest side of the triangle.
- (A)  $2\sqrt{2}$                       (B)  $\sqrt{2} + \sqrt{6}$                       (C)  $\sqrt{3} + \sqrt{6}$                       (D)  $2 + \sqrt{6}$                       (E) NOTA
12. Compute the sum of all integers  $x$  which satisfy  $|x - 1| \leq 11$ .
- (A)  $-23$                       (B)  $0$                       (C)  $3$                       (D)  $23$                       (E) NOTA
13. How many of the following number sets contain the number  $0$ ?
- I.*      Real Numbers  
*II.*     Positive Integers  
*III.*    Nonnegative Integers  
*IV.*    Nonpositive Integers
- (A)  $1$                       (B)  $2$                       (C)  $3$                       (D)  $4$                       (E) NOTA
14. If a Daniel can read 10 pages in 7 minutes, how many Daniels would it take to collectively read 45 pages in 1 minute and 45 seconds? Assume all Daniels read at a constant rate.
- (A)  $10$                       (B)  $18$                       (C)  $20$                       (D)  $36$                       (E) NOTA
15. Steven is buying letters at a store which offers all consonants (letters other than A, E, I, O, U) for free, and each vowel at some price per letter (the price for different vowels may be different). At this store, the words MISSOURI and UTAH would cost \$9 each, MAINE would cost \$8, and FLORIDA and TEXAS cost \$7 each. Determine the cost in dollars for the word ARIZONA.
- (A) \$9                      (B) \$10                      (C) \$11                      (D) \$12                      (E) NOTA
16. A nondegenerate triangle has sides of length 3, 7, and  $x$ . The maximum and minimum integral values of  $x$  are  $a$  and  $b$ , respectively. Compute the value of  $a + b$ .
- (A)  $13$                       (B)  $14$                       (C)  $15$                       (D)  $16$                       (E) NOTA
17. When a soda is shaken,  $x$  fl. oz of soda will fizz up and expand to a volume of  $6x$  fl. oz. In a can with 12 fl. oz of soda and 1 fl. oz of free space, determine the maximum amount of soda in fluid ounces which can fizz up within the boundaries of the can.
- (A)  $0$                       (B)  $\frac{1}{6}$                       (C)  $\frac{1}{3}$                       (D)  $1$                       (E) NOTA
18. Ian is playing Line Rider. He makes a line of length 6 at a  $30^\circ$  angle with a horizontal line. He then draws a penguin which moves down the entirety of the angled line. Determine the horizontal displacement of the penguin.
- (A)  $3$                       (B)  $3\sqrt{2}$                       (C)  $3\sqrt{3}$                       (D)  $6$                       (E) NOTA
19. Which of the following answers is NOT equal to the other three?
- (A)  $2^{\frac{1}{2}}$                       (B)  $\sqrt{2}$                       (C)  $\frac{2^1}{2^2}$                       (D)  $4^{\frac{1}{4}}$                       (E) NOTA
20. Compute the sum of the mean, median, and mode of the data set  $\{20, 23, 26, 21, 23, 19\}$ .
- (A)  $67$                       (B)  $67\frac{1}{2}$                       (C)  $69$                       (D)  $70$                       (E) NOTA
21. Which of the following answers is NOT a solution to the equation  $(x^2 - 4x + 4)^{(x^2 - 3x - 4)} = 1$ ?
- (A)  $-1$                       (B)  $1$                       (C)  $3$                       (D)  $4$                       (E) NOTA

22. Shaniqua draws a circle, equilateral triangle, and a square such that the greatest distance between any two points on each shape is 4. List the shapes in order of area from least to greatest.
- (A) Square, Circle, Triangle  
 (B) Triangle, Square, Circle  
 (C) Triangle, Circle, Square  
 (D) Circle, Triangle, Square  
 (E) NOTA
23. Anisha turns on the fan in her room. The fan has a radius of 3 feet and the fan has a speed of 100 revolutions per minute. Unbeknownst to her, there is a lizard on one of the fan's blades at a distance of 1 foot from the center. The lizard then crawls to the edge of the blade. How much faster is the lizard traveling at the end of the blade than at its initial position? Answers are in feet/minute.
- (A)  $200\pi$                       (B)  $400\pi$                       (C)  $600\pi$                       (D)  $800\pi$                       (E) NOTA
24. A circle is inscribed within a square which has a side length of 6. Compute the area of the circle.
- (A)  $9\pi$                       (B)  $18\pi$                       (C)  $27\pi$                       (D)  $36\pi$                       (E) NOTA
25. Which of the following answers is NOT a triangular number?
- (A) 1                      (B) 3                      (C) 55                      (D) 196                      (E) NOTA
26. Define  $f(x)$  as
- $$f(x) = \begin{cases} x + 5 & x < 0 \\ x^2 & 0 \leq x \leq 5 \\ -x & x > 5 \end{cases}.$$
- Compute the value of  $f(f(f(f(6))))$ .
- (A)  $-11$                       (B) 4                      (C) 16                      (D) Does Not Exist                      (E) NOTA
27. Dr. Fraser is given a frisbee. Elated, he throws it in a straight line; it flies 50 yards on this line before it is caught by Alan. Alan, standing directly east of Dr. Fraser, runs 14 yards directly north and catches the frisbee. Before the frisbee was thrown, how many feet apart were Alan and Dr. Fraser?
- (A) 36                      (B) 48                      (C) 64                      (D) 144                      (E) NOTA
28. Let the sum of 59 and 93 be  $100A + 10B + C$ , where  $A, B, C$  are digits. The product of  $A, B$ , and  $C$  is  $D$  (a number, not necessarily one digit). The remainder when  $100A + 10B + C$  is divided by  $D$  is  $E$ . Compute the product  $ABCDE$ .
- (A) 0                      (B) 50                      (C) 200                      (D) 500                      (E) NOTA
29. Determine the remainder when  $3x^3 - x^2 + 2x - 4$  is divided by  $(x - 2)$ .
- (A)  $-10$                       (B) 0                      (C) 10                      (D) 20                      (E) NOTA
30. The Atlanta Falcons have 5 wins and 2 losses. What percent of games did they win, rounded to one decimal place?
- (A) 25.0%                      (B) 40.0%                      (C) 71.4%                      (D) 71.5%                      (E) NOTA