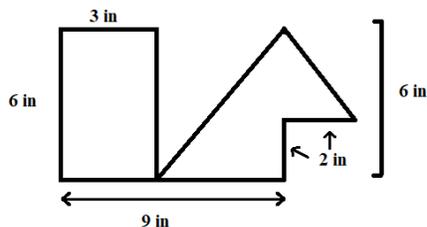*For all questions, answer choice (E) NOTA means that none of the given answers is correct. Good Luck!*

1. Leana loves cheese and is making a cylindrical cheese block that has a radius of 5 inches and height of 5 inches. Find the surface area of the cheese block to the nearest hundredth. Use 3.14 for π.

   (A) 314.0 in^2 (B) 235.6 in^2 (C) 157.0 in^2 (D) 280.7 in^2 (E) NOTA

2. Using the dimensions from Question 1, find the volume. Use 3.14 for π.

   (A) 353.35 in^3 (B) 392.5 in^3 (C) 298.3 in^3 (D) 157 in^3 (E) NOTA

3. Find the area of the following figure, in inches squared.

   (A) 36   (B) 44   (C) 40   (D) 58   (E) NOTA

4. Leana, Cherry, and Shiv have 103 total tennis balls. Some were brought by the three and some were donated by their tennis coach. Leana brought half the number balls as Cherry. Cherry brought 2 times as many balls as Shiv. If Shiv brought 25 tennis balls, how many balls were donated by their tennis coach?

   (A) 25   (B) 50   (C) 5   (D) 3   (E) NOTA

5. Bob, Billy, and Joe were purchasing prep books to prepare for their AP Exams in May. Bob went to Books-A-Million and bought 4 prep books for $64.87. Billy went to Barnes and Nobles and bought 5 books for $73.54. Joe ordered from Amazon and bought 6 books for $80.43. Who got the best deal? (The answer is two names if two tied for the best deal.)

   (A) Bob   (B) Billy   (C) Joe   (D) Billy & Joe   (E) NOTA

6. Given that $x = 5$, evaluate the following:

   $$2x^2 + 4x + 7$$

   (A) 37   (B) 50   (C) 75   (D) 27   (E) NOTA

   Use the following stem and leaf plot for questions 7 and 8:

Stem	Leaf
1	18
2	2
3	26
5	36
8	4

7. Calculate the mean.

   (A) 26.83   (B) 33.50   (C) 37.87   (D) 39.00   (E) NOTA

8. What is the sum of the range and median?

(A) 86   (B) 33.5   (C) 65   (D) 129   (E) NOTA

9. Grace has 5 gallons of milk. She sells 12 quarts and drinks 6 pints of milk. How many cups of milk does Grace have left?

(A) 20   (B) 10   (C) 32   (D) 16   (E) NOTA

10. Armaan loves to visit different bookstores and buy their collections. At a bookstore, there are 1600 books and 200 movies. $\frac{5}{8}$ of the books are fiction and the rest are nonfiction. $\frac{2}{5}$ of the movies are documentaries and the rest are comedies. Each nonfiction book is \$9 and each comedy is \$6 . If Armaan bought $\frac{7}{15}$ of the nonfiction books and $\frac{1}{5}$ of the comedies, how much money did Armaan spend at the bookstore?

(A) 5400   (B) 2664   (C) 3240   (D) 6120   (E) NOTA

11. Leana loves free samosas and going to movies. At the movie theatre, she found a birthday girl and asked her for samosas. The birthday girl agreed to give her a samosa, but only if Leana could solve a math problem. Help Leana out by finding the sum of the following Roman Numerals: MDLV, MDVIII, LXI.

(A) 3174   (B) 3172   (C) 3124   (D) 3122   (E) NOTA

12. Solve:

$$1 \cdot 1^0 + \frac{9 \cdot 9}{3^3 \cdot 3} - \sqrt{4}$$

(A) −1   (B) 1   (C) 8   (D) 0   (E) NOTA

13. Diyah and Nalina were playing tag. To get away from Diyah, Nalina decides to climb a tree by jumping to catch a branch. The branch was 190.5 cm above the ground and Nalina is 5'1" including her arm length. How high does Nalina have to jump to reach the branch? (Hint: There are 2.54 centimeters in an inch.)

(A) 35.56 in   (B) 61 in   (C) 45.43 in   (D) 28.3 in   (E) NOTA

14. Solve:

$$\frac{201!}{199! \cdot 2!}$$

(A) 40200   (B) 20100   (C) 19900   (D) 0.505   (E) NOTA

15. Deekshita and Keerthana are determined to work out this year. It is possible for them to lose one pound by running 5 miles. They both can run 5 miles in 30 minutes. If Deekshita and Keerthana will dedicate 10 hours to running every week, then how many pounds will each of them lose each week?

(A) 100   (B) 500   (C) 20   (D) 25   (E) NOTA

16. Bob and Billy are number psychics and always think of numbers that are related to each other. The sum of two numbers they think of is 67. The difference of these two numbers is 5. What is the greater of the two numbers?

(A) 25   (B) 36   (C) 42   (D) 53   (E) NOTA

17. Order the following from least to greatest: $\sqrt{484}, \frac{2}{9}, 2\frac{2}{5}, 67\%, 3!$

(A) $\frac{2}{9}, 3!, 67\%, 2\frac{2}{5}, \sqrt{484}$ (B) $\sqrt{484}, 2\frac{2}{5}, 3!, 67\%, \frac{2}{9}$ (C) $\frac{2}{9}, 67\%, 3!, 2\frac{2}{5}, \sqrt{484}$ (D) $67\%, \frac{2}{9}, 2\frac{2}{5}, 3!, \sqrt{484}$ (E) NOTA
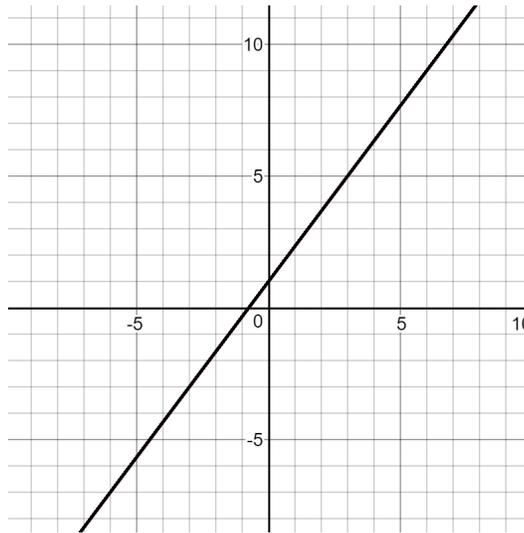
18. Grace and Chaquayla are running a carnival booth. At the booth, there is a target with three areas worth 25 points, 50 points, and 100 points. The probability that Grace hits the area worth 25 points is $\frac{1}{3}$, and the probability that she hits the area worth 50 points is $\frac{1}{2}$. What is the probability Grace hits the area worth 100 points, given that she always hits somewhere on the target?

    (A) $\frac{5}{6}$ (B) $\frac{1}{6}$ (C) $\frac{2}{5}$ (D) $\frac{3}{5}$ (E) NOTA

19. Complementary angles are two angles that add up to 90 degrees. The measure of one angle, x, is 22 degrees less than the measure of its complement. What is the value of angle x, in degrees?

    (A) 44   (B) 34   (C) 32   (D) 42   (E) NOTA

20. Billy and Diyah went out for dinner to their favorite Italian restaurant, Bob's. Billy's bill was $45.13 and Diyah's bill was $39.24. Billy gave a tip of 2% of his bill, while Diyah gave a tip of 5% of her bill. What was the total amount of money, rounded to the nearest cent, spent by both Billy and Diyah at Bob's after tip?

    (A) $87.23   (B) $114.07   (C) $85.21   (D) $46.03   (E) NOTA

21. In how many different ways can the letters in the word MATH be arranged? For example: ATMH and MAHT are two arrangements.

    (A) 36   (B) 24   (C) 12   (D) 64   (E) NOTA

22. Ishana has a portrait stand where she paints only two types of portraits. It takes Ishana 5 minutes to paint a small 5×5 canvas portrait and 20 minutes to paint a 1×10 canvas portrait. There are 20 people in line and 7 of them want a 5×5 portrait painted. How much time will Sam have to spend to paint canvases for all 20 people?

    (A) 3 hours 20 minutes   (B) 12300 seconds   (C) 12000 seconds   (D) 200 minutes   (E) NOTA

23. At the Pangaea dinner, the menu had the following options:

    ·   A plate with foods from 3 different countries costs $5.
    ·   A plate with foods from 5 different countries costs $6.
    ·   A plate with foods from 7 different countries costs $7.

    Jawad and Antonio were very hungry that evening and decided to buy 2 plates with food from 3 countries, 1 plate with food from 5 countries, and 1 plate with food from 7 countries. If Antonio and Jawad only pay in quarters, dimes, and nickels, which of the following is a possible combination of coins that they used to pay for their dinner?

    (A) 89 quarters, 7 dimes, 1 nickel
    (B) 90 Quarters, 6 dimes, 1 nickel
    (C) 91 Quarters, 1 dime, 2 nickels
    (D) 88 Quarters, 7 dimes, 2 nickels
    (E) NOTA

24. Eduardo and Mahir moved into a new house that has a big tree in its backyard. The distance between the tree and the house is 6 meters and the height of the tree is 26.24 feet. What is the distance between the top of the tree to the bottom of the house, given that 1 meter = 3.28 feet?

    (A) 14.43 feet   (B) 5.73 feet   (C) 32.80 feet   (D) 20.32 feet   (E) NOTA

25. Simplify the expression:

$$\frac{(256)(x^5)(y^{-2})}{(16)(x^{-2})(x^7)((y^4)(z)}$$

(A) $\dfrac{16x^3}{y^9z}$ 　　　　　(B) $\dfrac{16}{y^6z}$ 　　　　　(C) $\dfrac{16}{x^4y^2z}$ 　　　　　(D) $\dfrac{16x^4}{y^2z}$ 　　　　　(E) NOTA

26. What is the slope of the line shown in the graph below?

(A) $\dfrac{4}{3}$ 　　　　　(B) $-\dfrac{4}{3}$ 　　　　　(C) $\dfrac{3}{4}$ 　　　　　(D) $-\dfrac{3}{4}$ 　　　　　(E) NOTA

27. Aafia loves pink lollipops. In a bowl of lollipops, there are 4 pink, 7 blue, 3 green, and 5 orange lollipops. What is the probability she selects 2 pink lollipops in a row, without replacement?

(A) $\dfrac{16}{225}$ 　　　　　(B) $\dfrac{2}{57}$ 　　　　　(C) $\dfrac{10}{57}$ 　　　　　(D) $\dfrac{6}{969}$ 　　　　　(E) NOTA

28. In a data set of 7 numbers, the numbers increase from least to greatest by increments of 2. If the mean and median are 7, what is the smallest number in the data set?

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

29. Find the sum of the prime numbers in the following data set:

$$\{67, 34, 45, 23, 54, 64, 97, 13, 14, 37, 39, 46, 57, 134, 346, 369, 325, 753, 234, 233, 137, 784\}$$

(A) 607 　　　　　(B) 374 　　　　　(C) 540 　　　　　(D) 658 　　　　　(E) NOTA

30. Rehan was working on his math worksheet when his dog tore off half of it. Figure out the next three numbers of the sequence, and find 10 less than the sum of those three numbers: 3,6,11,18,27,38,...

(A) 200 　　　　　(B) 199 　　　　　(C) 190 　　　　　(D) 194 　　　　　(E) NOTA