1. What is the surface area of a cube whose volume is 27 cm^3?

    (A) 6 cm^2 (B) 27 cm^2 (C) 36 cm^2 (D) 54 cm^2 (E) 144 cm^2

2. A fuse burns at a rate of exactly $2\frac{2}{3}$ centimeters per minute. How many minutes will it take to burn a 5 cm fuse?

    (A) $\frac{8}{15}$ (B) $1\frac{7}{8}$ (C) 2 (D) $2\frac{1}{7}$ (E) $13\frac{1}{3}$

3. T-shirts cost \$11. Sweatshirts cost \$18. Richard spent \$179 on t-shirts and sweatshirts. How many t-shirts did Richard buy?

    (A) 7 (B) 9 (C) 11 (D) 13 (E) 15

4. Trapezoid $ABCD$ has right angles A and B, with $AB = 3$, $BC = 4$, and $CD = 5$. Find the area of trapezoid $ABCD$.

    (A) 9 (B) 12.5 (C) 18 (D) 24 (E) 36

5. Which of the answer choices could be used to make the statement below true?

    The letter "e" appears exactly _____ times in this sentence.

    (A) ten   (B) eleven   (C) twelve   (D) thirteen   (E) fourteen

6. What is the smallest positive integer n for which $n/3$ is a perfect square, and $n/2$ is a perfect cube?

    (A) 216 (B) 324 (C) 432 (D) 864 (E) 1296

7. Simplify: $\frac{1}{3} - \frac{1}{3^2} + \frac{1}{3^3} - \frac{1}{3^4} + \frac{1}{3^5} - \frac{1}{3^6} + \cdots$.

    (A) 0 (B) $\frac{1}{6}$ (C) $\frac{1}{5}$ (D) $\frac{1}{4}$ (E) $\frac{1}{3}$

8. A segment graphed on the coordinate plane has its endpoints at $(3, a)$ and $(21, -4b)$. The midpoint of the segment is at $(2a, b)$. Find $a + b$.

    (A) -1 (B) 1 (C) 3 (D) 5 (E) 7

9. After the first two terms, successive terms in the sequence below alternate between the sum of the two previous terms and the positive difference of the two previous terms. The number 199 appears twice in the sequence. What is the sum of the terms that appear between the two appearances of 199 in the sequence?

    $$1,\ 2,\ 3,\ 1,\ 4,\ 3,\ 7,\ 4,\ 11,\ 7,\ 18,\ \ldots.$$

    (A) 275 (B) 395 (C) 425 (D) 445 (E) 465

10. Find the sum of all solutions to the following equation:

    $$x + 2 = 3\sqrt{x}.$$

    (A) 5 (B) 6 (C) 7 (D) 8 (E) 9

11. Each of the integers 2, 3, 13, 14, 22, and 23 labels one vertex of a regular hexagon such that the sum of the numbers on any two adjacent vertices is a perfect square. What number is on the vertex directly opposite the vertex labeled 23?

   (A) 2   (B) 3   (C) 13   (D) 14   (E) 22

12. Three people are selected at random. What is the probability that no two were born on the same day of the week?

   (A) 30/49   (B) 3/7   (C) 19/49   (D) 5/7   (E) 6/7

13. Sam always drives the same way to work. If Sam leaves for work at 7am and averages 40 miles per hour, he will arrive 10 minutes late. If he leaves at 7am and averages 50 miles per hour, he will arrive exactly on time. One morning, Sam left for work at 7am and arrived 5 minutes early. What was Sam's average speed in miles per hour that morning?

   (A) 55   (B) $56\frac{1}{3}$ (C) $57\frac{1}{7}$ (D) $58\frac{1}{4}$ (E) 60

14. Both a and n are positive integers such that $\frac{144}{a} = n$. What is the sum of all possible values of n?

   (A) 352   (B) 373   (C) 377   (D) 403   (E) 415

15. The sum of the digits of 2011 is 4. How many positive integers **less** than 2011 have a digit sum of 4?

   (A) 25   (B) 26   (C) 27   (D) 34   (E) 35

1. Seymore started chopping a pile of 70 carrots at a rate of 5 carrots per minute. Three minutes later, Edna joined Seymore. Edna chopped carrots at a rate of 6 per minute. When they finished, how many carrots had Edna chopped?

2. 30% more than x is 30% less than $x + 30$. Find x.

3. What 2-digit positive integer is twice the product of its digits?

4. The number of digits required to number the pages of a book, starting at 1, is twice the number printed on the last page of the book. How many pages are in the book?

5. There are 17 players in a bowling league. During the season, every player bowls exactly one game against each of the other 16 players. There are no ties. What is the greatest possible number of players who could finish the season with more wins than losses?

6. Eight fair dice are randomly assembled to form a cube. The exterior faces of the cube are painted red. The cube is then disassembled, and two of the eight dice are selected at random and rolled. What is the probability of rolling two red faces whose sum is 7?

7. The midpoints of the sides of a regular hexagon are connected to form a smaller hexagon. The area of the smaller hexagon is 60. What is the area of the original (larger) hexagon?

8. For how many ordered pairs of positive integers (a, b) is $\frac{2}{a} + \frac{3}{b}$ an integer?