



Competitive Math Diagnostic Test:

Let's see if this course is right for your level!

Instructions: Take some time to solve each of these problems. If you are solving them with little to no difficulty, this course may not be for you. However, if you find that they are fairly challenging, sign on up!

1. The number N is a two-digit number.

- When N is divided by 9, the remainder is 1.
- When N is divided by 10, the remainder is 3.

What is the remainder when N is divided by 11?

- (A) 0 (B) 2 (C) 4 (D) 5 (E) 7

2. The Amaco Middle School bookstore sells pencils costing a whole number of cents. Some seventh graders each bought a pencil, paying a total of 1.43. Some of the 30 sixth graders each bought a pencil, and they paid a total of 1.95. How many more sixth graders than seventh graders bought a pencil?

- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5

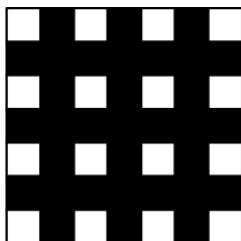
3. Austin and Temple are 50 miles apart along Interstate 35. Bea drove from Austin to her daughter's house in Temple, averaging 60 miles per hour. Leaving the car with her daughter, Bea rode a bus back to Austin along the same route and averaged 40 miles per hour on the return trip. What was the average speed for the round trip, in miles per hour?

- (A) 46 (B) 48 (C) 50 (D) 52 (E) 54

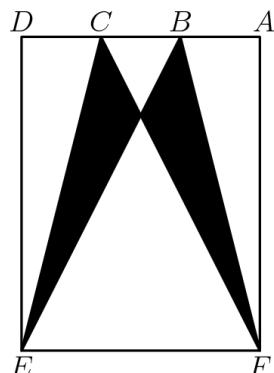
4. How many 3-digit positive integers have digits whose product equals 24?

- (A) 12 (B) 15 (C) 18 (D) 21 (E) 24

5. The diagram represents a 7-foot-by-7-foot floor that is tiled with 1-square-foot black tiles and white tiles. Notice that the corners have white tiles. If a 15-foot-by-15-foot floor is to be tiled in the same manner, how many white tiles will be needed?



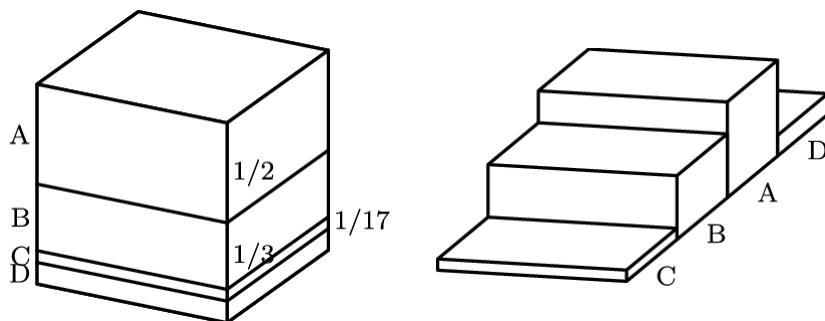
- (A) 49 (B) 57 (C) 64 (D) 96 (E) 126
6. Rectangle $DEFA$ below is a 3×4 rectangle with $DC = CB = BA = 1$. The area of the "bat wings" (shaded area) is



- (A) 2 (B) $2\frac{1}{2}$ (C) 3 (D) $3\frac{1}{2}$ (E) 4
7. How many whole numbers between 1 and 1000 do not contain the digit 1?
- (A) 512 (B) 648 (C) 720 (D) 728 (E) 800

8. The letters A , B , C and D represent digits. If $\begin{array}{r} & A & B \\ + & C & A \\ \hline D & A \end{array}$ and $\begin{array}{r} & A & B \\ - & C & A \\ \hline A \end{array}$,
- what digit does D represent?
- (A) 5 (B) 6 (C) 7 (D) 8 (E) 9

9. A one-cubic-foot cube is cut into four pieces by three cuts parallel to the top face of the cube. The first cut is $\frac{1}{2}$ foot from the top face. The second cut is $\frac{1}{3}$ foot below the first cut, and the third cut is $\frac{1}{17}$ foot below the second cut. From the top to the bottom the pieces are labeled A, B, C, and D. The pieces are then glued together end to end as shown in the second diagram. What is the total surface area of this solid in square feet?



- (A) 6 (B) 7 (C) $\frac{419}{51}$ (D) $\frac{158}{17}$ (E) 11