Topic: Simplifying fractions and equivalent fractions

Question: Simplify the fraction to lowest terms.

$$\frac{50}{85}$$

Answer choices:

A $\frac{10}{17}$

B $\frac{25}{42}$

C $\frac{3}{4}$

D $\frac{10}{15}$

Solution: A

Let's find the prime factorizations of the numerator and the denominator.

$$\frac{50}{85}$$

$$\frac{5 \cdot 5 \cdot 2}{17 \cdot 5}$$

The only factor that's common to the numerator and denominator is 5. Since 5 occurs twice as a factor in the numerator but only once in the denominator, we'll cancel one of the 5's in the numerator against the 5 in the denominator, leaving just

$$\frac{5 \cdot 2}{17}$$

$$\frac{10}{17}$$

Topic: Simplifying fractions and equivalent fractions

Question: Simplify the fraction to lowest terms.

$$\frac{6}{30}$$

Answer choices:

A $\frac{1}{10}$

B $\frac{4}{7}$

C $\frac{2}{3}$

D $\frac{1}{5}$

Solution: D

We realize that 6 and 30 have a common factor of 6. Therefore, we'll divide both the numerator and denominator by 6.

$$\frac{6 \div 6}{30 \div 6}$$

$$\frac{1}{5}$$

The fraction can't be reduced any further.

Topic: Simplifying fractions and equivalent fractions

Question: Which fraction is equivalent to $3/7$?

Answer choices:

A $\frac{7}{14}$

B $\frac{24}{56}$

C $\frac{10}{21}$

D $\frac{7}{3}$

Solution: B

Of these answer choices, the fraction in answer choice B is the only fraction that's equivalent to $3/7$. To show this, we'll break the numerator and denominator of $24/56$ into their prime factors.

$$\frac{24}{56}$$

$$\frac{3 \cdot 2 \cdot 2 \cdot 2}{7 \cdot 2 \cdot 2 \cdot 2}$$

The prime factor 2 occurs three times in both the numerator and the denominator, so we can cancel all of those factors, and we'll be left with

$$\frac{3}{7}$$

There's another way to show that $24/56$ is equivalent to $3/7$: We'd have to multiply the numerator of $3/7$, 3, by 8 in order to get the numerator of $24/56$, 24. Therefore, we'd have to multiply the denominator of $3/7$, 7 by the same number (8) to get the denominator of the fraction that's equivalent to $3/7$ and has a numerator of 24.

$$\frac{3}{7} = \frac{3 \cdot 8}{7 \cdot 8} = \frac{24}{56}$$