Topic: Complex fractions, ratio and proportion

Question: Solve for the variable.

$$\frac{\left(\frac{1}{2}\right)}{x} = \frac{\left(\frac{1}{4}\right)}{\left(\frac{1}{5}\right)}$$

Answer choices:

A $\quad \dfrac{1}{8}$

B $\quad \dfrac{1}{10}$

C $\quad \dfrac{2}{5}$

D $\quad \dfrac{1}{20}$

Solution: C

We'll cross multiply.

$$\frac{\left(\frac{1}{2}\right)}{x} = \frac{\left(\frac{1}{4}\right)}{\left(\frac{1}{5}\right)}$$

$$\frac{1}{2} \cdot \frac{1}{5} = \frac{1}{4} \cdot x$$

Now we can simplify by multiplying the fractions.

$$\frac{1 \cdot 1}{2 \cdot 5} = \frac{x}{4}$$

$$\frac{1}{10} = \frac{x}{4}$$

Multiply both sides of this equation by 4 to solve for x.

$$\frac{4}{10} = x$$

$$x = \frac{2}{5}$$

Topic: Complex fractions, ratio and proportion

Question: Solve for the variable.

$$\frac{\left(\frac{x}{3}\right)}{\left(\frac{7}{2}\right)} = \frac{\left(\frac{3}{2}\right)}{\left(\frac{2}{5}\right)}$$

Answer choices:

A $\quad x = \dfrac{315}{8}$

B $\quad x = \dfrac{15}{4}$

C $\quad x = \dfrac{21}{2}$

D $\quad x = \dfrac{2}{7}$

Solution: A

Instead of dividing by the fractions in the denominators, we can multiply by their reciprocals.

$$\frac{\left(\frac{x}{3}\right)}{\left(\frac{7}{2}\right)} = \frac{\left(\frac{3}{2}\right)}{\left(\frac{2}{5}\right)}$$

$$\frac{x}{3} \cdot \frac{2}{7} = \frac{3}{2} \cdot \frac{5}{2}$$

Multiply fractions.

$$\frac{2x}{21} = \frac{15}{4}$$

Multiply both sides by 21.

$$2x = 21 \cdot \frac{15}{4}$$

Divide by 2 to solve for x. Then multiply fractions to simplify.

$$x = \frac{21}{2} \cdot \frac{15}{4}$$

$$x = \frac{315}{8}$$

Topic: Complex fractions, ratio and proportion

Question: Solve this proportion for x.

$$\frac{\left(\frac{2}{3}\right)}{\left(\frac{4}{9}\right)} = \frac{\left(\frac{7}{8}\right)}{x}$$

Answer choices:

A $\dfrac{7}{18}$

B $\dfrac{9}{14}$

C $\dfrac{7}{12}$

D $\dfrac{9}{11}$

Solution: C

To solve this proportion

$$\frac{\left(\frac{2}{3}\right)}{\left(\frac{4}{9}\right)} = \frac{\left(\frac{7}{8}\right)}{x}$$

we'll start by cross-multiplying.

$$\frac{2}{3}x = \frac{4}{9} \cdot \frac{7}{8}$$

$$\frac{2}{3}x = \frac{28}{72}$$

$$\frac{2}{3}x = \frac{7}{18}$$

Multiply both sides by 3/2.

$$\frac{3}{2} \cdot \frac{2}{3}x = \frac{3}{2} \cdot \frac{7}{18}$$

$$x = \frac{3 \cdot 7}{2 \cdot 18}$$

$$x = \frac{21}{36}$$

$$x = \frac{7}{12}$$