Fractions: Complex Fractions

Earlier, we saw that the fraction bar means division: $\frac{2}{7} \div \frac{8}{21}$ could be thought of as the **complex fraction**: $\dfrac{\frac{2}{7}}{\frac{8}{21}}$

Vocabulary

Complex fraction	A fraction with a fraction in the numerator and a fraction in the denominator.

To simplify a complex fraction, write the fraction as a division problem and follow the rules for dividing fractions.

$$\frac{\frac{2}{7}}{\frac{8}{21}} \rightarrow \frac{2}{7} \div \frac{8}{21} \rightarrow \frac{2}{7} \bullet \frac{21}{8} \rightarrow \frac{2}{7} \bullet \frac{3 \cdot 7}{4 \cdot 2} \rightarrow \frac{1}{1} \bullet \frac{3}{4} \rightarrow \frac{3}{4}$$

If the numerator or the denominator of the complex fraction is composed of something more than a single fraction, follow the rules for forming a single fraction in the numerator and in the denominator, then simplify.

$$\frac{4+\frac{2}{7}}{\frac{2}{3}-\frac{8}{21}} \rightarrow \frac{\frac{28}{7}+\frac{2}{7}}{\frac{14}{21}-\frac{8}{21}} \rightarrow \frac{\frac{30}{7}}{\frac{6}{21}} \rightarrow \frac{30}{7} \bullet \frac{21}{6} \rightarrow \frac{5 \cdot 6}{7} \bullet \frac{3 \cdot 7}{6} \rightarrow \frac{5}{1} \bullet \frac{3}{1} \rightarrow 15$$

TRY:

$$\frac{\frac{3}{7}}{\frac{5}{14}}$$

$$\frac{\frac{2}{5}+\frac{2}{3}}{3-1\frac{2}{5}}$$