Review Exercise Set 13

Exercise 1: Multiply.
\[
\frac{2}{15} \times \frac{5}{6}
\]

Exercise 2: Multiply.
\[
\frac{3}{4} \times \frac{8}{15}
\]

Exercise 3: Multiply.
\[
\frac{5}{12} \times \frac{9}{35} \times \frac{7}{8}
\]

Exercise 4: Divide.
\[
\frac{3}{8} \div \frac{2}{3}
\]

Exercise 5: Divide.
\[
\frac{15}{16} \div \frac{9}{4}
\]
Review Exercise Set 13 Answer Key

Exercise 1: Multiply.

\[
\frac{2}{15} \times \frac{5}{6}
\]

First, rewrite the problem as a single fraction by distributing the multiplication to both the numerator and denominator. Then perform prime factorization of the numerator and denominator. \(15 = 5 \times 3\) and \(6 = 3 \times 2\).

\[
= \frac{2 \times 5}{15 \times 6}
\]

\[
= \frac{2 \times 5}{5 \times 3 \times 3 \times 2}
\]

Reduce any common factors. When reducing the common factors remember to keep a 1 in their place.

\[
= \frac{2^1 \times 5^1}{5^1 \times 3 \times 3 \times 2^1}
\]

multiply across the numerator and denominator

\[
= \frac{1}{9}
\]

Exercise 2: Multiply.

\[
\frac{-3}{4} \times \frac{8}{15}
\]

\[
= \frac{-3 \times 8}{4 \times 15}
\]

Prime factorization: \(8 = 2^2 \times 2\); \(4 = 2 \times 2\); and \(15 = 3 \times 5\)

\[
= \frac{-3 \times 2 \times 2 \times 2}{2 \times 2 \times 3 \times 5}
\]

\[
= \frac{-2^1 \times 2^1 \times 2^1 \times 2}{2^1 \times 2^1 \times 3^1 \times 5}
\]

\[
= \frac{-2}{5}
\]
Exercise 3: Multiply.

\[
\frac{5}{12} \times \frac{9}{35} \times \frac{7}{8}
\]

Even though this problem has three fractions, we will work it exactly the same way as before

\[
= \frac{5 \times 9 \times 7}{12 \times 35 \times 8}
\]

Prime factorization: 9 = 3*3 ; 12 = 2*2*3 ; 35 = 5*7 ; and 8 = 2*2*2

\[
= \frac{5 \times 3 \times 3 \times 7}{2 \times 2 \times 3 \times 5 \times 7 \times 2 \times 2 \times 2}
\]

\[
= \frac{5^1 \times 3^1 \times 3 \times 7^1}{2 \times 2 \times 3^1 \times 5^1 \times 7^1 \times 2 \times 2 \times 2}
\]

\[
= \frac{3}{2 \times 2 \times 2 \times 2}
\]

\[
= \frac{3}{32}
\]

Exercise 4: Divide.

\[
\frac{3}{8} \div \frac{2}{3}
\]

When you have a problem where you are asked to divide two fractions, you want to convert the problem into a multiplication problem by inverting (flipping) the second fraction.

\[
= \frac{3}{8} \times \frac{3}{2}
\]

Now perform the problem just like the others

\[
= \frac{3 \times 3}{8 \times 2}
\]

\[
= \frac{3 \times 3}{2 \times 2 \times 2 \times 2}
\]

Some problems may not have any common factors so you would simply multiply to get the answer

\[
= \frac{9}{16}
\]
Exercise 5: Divide.

\[
\frac{15}{16} \div \frac{9}{4}
\]

\[
= \frac{15 \times 4}{16 \times 9}
\]

\[
= \frac{15 \times 4}{16 \times 9}
\]

\[
= \frac{5 \times 3 \times 2 \times 2}{2 \times 2 \times 2 \times 2 \times 3 \times 3}
\]

\[
= \frac{5 \times 3^1 \times 2^1 \times 2^1}{2^2 \times 2^1 \times 2^1 \times 3^1 \times 3}
\]

\[
= \frac{5}{12}
\]