Lesson 5-7

Example 1 Divide by a Fraction
Find $\dfrac{4}{9} \div \dfrac{5}{6}$. Write in simplest form.

$$\dfrac{4}{9} \div \dfrac{5}{6} = \dfrac{4}{9} \cdot \dfrac{6}{5}$$ Multiply by the reciprocal of $\dfrac{5}{6}$, which is $\dfrac{6}{5}$.

$$= \dfrac{4}{\cancel{9}_{3}} \cdot \dfrac{\cancel{6}^{2}}{5}$$ Divide by the GCF, 3.

$$= \dfrac{8}{15}$$ Multiply.

Example 2 Divide by Mixed Numbers
Find $12 \div 2\dfrac{1}{3}$. Write in simplest form.

$$12 \div 2\dfrac{1}{3} = 12 \div \dfrac{7}{3}$$ Rename $2\dfrac{1}{3}$ the mixed number as an improper fraction.

$$= \dfrac{12}{1} \cdot \dfrac{3}{7}$$ Multiply by the reciprocal of $\dfrac{7}{3}$, which is $\dfrac{3}{7}$.

$$= \dfrac{36}{7}$$ Multiply.

$$= 5\dfrac{1}{7}$$ Simplify.

Example 3 Divide by Mixed Numbers
Find $\dfrac{3}{4} \div 2\dfrac{1}{2}$. Write in simplest form.

$$\dfrac{3}{4} \div 2\dfrac{1}{2} = \dfrac{3}{4} \div \dfrac{5}{2}$$ Rename $2\dfrac{1}{2}$ as an improper fraction.

$$= \dfrac{3}{4} \cdot \dfrac{2}{5}$$ Multiply by the reciprocal of $\dfrac{5}{2}$, which is $\dfrac{2}{5}$.

$$= \dfrac{3}{\cancel{4}_{2}} \cdot \dfrac{\cancel{2}^{1}}{5}$$ Divide out common factors.

$$= \dfrac{3}{10}$$ Multiply.

Example 4 Divide by Mixed Numbers

SEWING Lisa is trimming a skirt with bands of ribbon each $1\frac{1}{6}$ yards long. How many bands will she have if she is cutting the pieces from a ribbon $5\frac{1}{4}$ yards long?

$5\frac{1}{4} \div 1\frac{1}{6} = \frac{21}{4} \div \frac{7}{6}$　　　Rename the mixed numbers as improper fractions.

$= \frac{21}{4} \cdot \frac{6}{7}$　　　Multiply by the reciprocal of $\frac{7}{6}$, which is $\frac{6}{7}$.

$= \frac{\overset{3}{\cancel{21}}}{\underset{2}{\cancel{4}}} \cdot \frac{\overset{3}{\cancel{6}}}{\underset{1}{\cancel{7}}}$　　　Divide out common factors.

$= \frac{9}{2} = 4\frac{1}{2}$　　　Multiply and simplify.

There will be $4\frac{1}{2}$ pieces of ribbon so Lisa will have 4 bands of ribbon on her skirt.