

Expressing Fractions as Decimals and Percents

- To write a fraction as a decimal, divide the numerator by the denominator.
To write a decimal as a fraction, write the decimal as a fraction with denominator of 10, 100, 1000, Then simplify if possible.

Example 1 Write each fraction as a decimal.

a. $\frac{5}{8}$

$$\frac{5}{8} = 5 \div 8$$

$$= 0.625$$

b. $\frac{3}{5}$

$$\frac{3}{5} = 3 \div 5$$

$$= 0.6$$

c. $\frac{1}{3}$

$$\frac{1}{3} = 1 \div 3$$

$$= 0.333\dots$$

Example 2 Write each decimal as a fraction.

a. 0.4

$$0.4 = \frac{4}{10} \text{ or } \frac{2}{5}$$

b. 0.005

$$0.005 = \frac{5}{1000} \text{ or } \frac{1}{200}$$

c. 0.98

$$0.98 = \frac{98}{100} \text{ or } \frac{49}{50}$$

- To write a fraction for a repeating decimal, use the method in Example 3 below.

Example 3 Write each decimal as a fraction.

a. $0.\overline{3}$

$$\text{Let } N = 0.\overline{3} \text{ or } 0.333\dots$$

$$\text{Then } 10N = 3.\overline{3} \text{ or } 3.333\dots$$

$$10N = 3.333\dots$$

$$-1N = 0.333\dots$$

$$\hline 9N = 3$$

$$N = \frac{3}{9} \text{ or } \frac{1}{3}$$

$$\text{So, } 0.\overline{3} = \frac{1}{3}.$$

Subtract 1N
from 10N.

b. $0.\overline{72}$

$$\text{Let } N = 0.\overline{72} \text{ or } 0.7272\dots$$

$$\text{Then } 100N = 72.7272\dots$$

$$100N = 72.7272$$

$$-1N = 00.7272$$

$$\hline 99N = 72$$

$$N = \frac{72}{99} \text{ or } \frac{8}{11}$$

$$\text{So, } 0.\overline{72} = \frac{8}{11}.$$

Subtract 1N
from 100N.

- To write a decimal as a percent, multiply by 100 and add the % symbol. Recall that to multiply by 100, you can move the decimal point two places to the right.
- To write a percent as a decimal, divide by 100 and remove the % symbol. Recall that to divide by 100, you can move the decimal point two places to the left.

Example 4 Write each decimal as a percent.

a. 0.35

$$0.35 = 0.35$$

$$= 35\%$$

b. 0.06

$$0.06 = 0.06$$

$$= 6\%$$

c. 0.008

$$0.008 = 0.008$$

$$= 0.8\%$$

Multiply by 100 and
add the % symbol.

Example 5 Write each percent as a decimal.

a. 36%

$$36\% = 36\%$$

$$= 0.36$$

b. 9%

$$9\% = 09\%$$

$$= 0.09$$

c. 120%

$$120\% = 120\%$$

$$= 1.2$$

Divide by 100 and
remove the % symbol.

- To write a fraction as a percent, express the fraction as a decimal. Then express the decimal as a percent.

Example 6 Write each fraction as a percent. Round to the nearest tenth of a percent, if necessary.

a. $\frac{1}{8}$

$$\begin{aligned}\frac{1}{8} &= 0.125 \\ &= 12.5\%\end{aligned}$$

b. $\frac{2}{3}$

$$\begin{aligned}\frac{2}{3} &= 0.6666\dots \\ &= 66.7\%\end{aligned}$$

c. $\frac{3}{600}$

$$\begin{aligned}\frac{3}{600} &= 0.005 \\ &= 0.5\%\end{aligned}$$

- To write a percent as a fraction, express the percent as a decimal. Then express the decimal as a fraction. Simplify if possible.

Example 7 Write each percent as a fraction.

a. 30%

$$\begin{aligned}30\% &= 0.30 \\ &= \frac{30}{100} \text{ or } \frac{3}{10}\end{aligned}$$

b. 140%

$$\begin{aligned}140\% &= 1.4 \\ &= \frac{14}{10} \text{ or } 1\frac{2}{5}\end{aligned}$$

c. 0.2%

$$\begin{aligned}0.2\% &= 0.002 \\ &= \frac{2}{1000} \text{ or } \frac{1}{500}\end{aligned}$$