6.4 (Part 2)   Percent Error

The percent error is a measure of the difference between an estimate, prediction, or measurement and the actual value.

$$\text{percent error} = \frac{\text{amount of error}}{\text{actual value}} \times 100$$

move decimal
2 spots to the
right

Example: Find the percent error. Round to the nearest tenth, if necessary.

a.) estimated weight: 8 pounds/actual weight: 6.4 pounds

$$\begin{array}{r} 7\cancel{8}.0 \\ -6.4 \\ \hline 1.6 \end{array}$$

$8 - 6.4 = 1.6$

$$\frac{1.6}{6.4} = 0.25 = \boxed{25\%}$$

$$\begin{array}{r} 0.25 \\ 6.4\overline{)1.6^{5}0\,0} \\ -1\,2\,8 \\ \hline 3\,2\,0 \\ -3\,2\,0 \\ \hline 0 \end{array}$$

Example: Find the percent error. Round to the nearest tenth, if necessary.

b.) measured length: 2.5 centimeters/actual length: 2.54 centimeters

$2.54 - 2.5 = 0.04$

$\dfrac{2.54}{-2.50}$
$\overline{0.04}$

$\dfrac{0.04}{2.54} \approx 0.0157 \approx \boxed{1.6\%}$

$$\begin{array}{r} 0.0157 \\ 2.54\overline{\smash{)}0.04000} \end{array}$$

-254
$\overline{1340}$
-1270
$\overline{1800}$
-1778
$\overline{122}$

Example: Find the percent error. Round to the nearest tenth, if necessary.

c.) estimated distance: 60 miles/actual distance: 75 miles

$75 - 60 = 15$

$\dfrac{15}{75} = \dfrac{1}{5} = 0.20 = \boxed{20\%}$

$$\begin{array}{r} .2 \\ 5\overline{\smash{)}1.0} \end{array}$$

-10
$\overline{0}$

Example: Find the percent error. Round to the nearest tenth, if necessary.

d.) measured area: 24 square inches/actual area: 22.5 square inches

$24 - 22.5 = 1.5$

$$\begin{array}{r} 24.\overset{3}{\cancel{0}}{}^{10} \\ -22.5 \\ \hline 1.5 \end{array}$$

$$\frac{1.5}{22.5} = 0.0666 \approx \boxed{6.7\%}$$

$$\begin{array}{r} 0.0666 \\ 22.5\overline{)1.5.0000} \\ -1350 \\ \hline 1500 \\ -1350 \\ \hline 1500 \\ -1350 \\ \hline 150 \end{array}$$

Example: Alyssa estimates that her school auditorium has 660 seats. It actually has 750 seats. What is the percent error of her estimate?

$750 - 660 = 90$

$$\frac{90}{750} = \frac{9}{75} = \frac{3}{25} = 0.12 = \boxed{12\%}$$

$$\begin{array}{r} .12 \\ 25\overline{)3.00} \\ 25 \\ \hline 50 \\ -50 \\ \hline 0 \end{array}$$

Example: Ben estimated that he would make $90 at his weekend job. He actually earned $80. What was the percent error of his estimate?

$$90 - 80 = 10$$

$$\frac{10}{80} = \frac{1}{8} = 0.125 = \boxed{12.5\%}$$

$$
\begin{array}{r}
.125 \\
8\overline{\smash{)}1.000} \\
-8 \\
\overline{20} \\
-16 \\
\overline{40} \\
-40 \\
\overline{0}
\end{array}
$$

Example: The estimate for the amount of rain in May in one part of Texas was 5.6 inches. The actual rainfall was 2.4 inches. What was the percent error of the estimate to the nearest percent? *nearest whole number*

$$5.6 - 2.4 = 3.2$$

$$\frac{3.2}{2.4} \approx 1.333 \approx 133.3 \approx \boxed{133\%}$$

$$
\begin{array}{r}
1.333 \\
2.4\overline{\smash{)}3.2.000} \\
-2\ 4 \\
\overline{80} \\
-7\ 2 \\
\overline{80} \\
-7\ 2 \\
\overline{80} \\
-7\ 2 \\
\overline{8}
\end{array}
$$