

Percent of Change, GPE, & % GPE

Percent of change: is a ratio which $= \frac{\text{Amount of Change}}{\text{Original Amount}}$ Usually it is written as a percent.

NOTE: When a value **INCREASES** from its original amount it is the percent of increase.
When a value **DECREASES** from its original amount it is the percent of decrease.

Example 1: The price of a sweater went from \$29.99 to \$24.99. Find the percent of change to the nearest tenth of a percent. Use an \uparrow or \downarrow to tell if it was an increase or a decrease.

$$= \frac{\text{Amount of Change}}{\text{Original Amount}} = \frac{29.99 - 24.99}{29.99} = \frac{5}{29.99} = .16672 \approx 16.672\%$$

$\downarrow 16.7\%$

Example 2: The number of rabbits in a particular area was 261. After 1 year, there were 16,384 rabbits. Find the percent of change to the nearest tenth of a percent. Use an \uparrow or \downarrow to tell if it was an increase or a decrease.

$$= \frac{16,384 - 261}{261} = \frac{16,123}{261} = 61.7739 \approx 6,177.39\%$$

$\uparrow 6,177.4\%$

Example 3: Identifying the Greatest Possible Error (GPE) is one half $\left(\frac{1}{2}\right)$ of that measuring unit.

Identify the GPE of each of the following:

.1 g

9 cm

11.34 in

5.101 mi

$.05g$

$.5cm$

$.005in$

$.0005mi$

Example 4: Identifying the percent error $= \frac{\text{Greatest Possible Error}}{\text{Measurement}}$

To the nearest tenth of a percent, identify the percent error in the measurement of 12.1 cm

You have to first identify the GPE of 12.1 cm which is $= .05cm$

$$\text{Next} = \frac{\text{GPE}}{\text{Measurement}} = \frac{.05cm}{12.1cm} = .004132 \approx .4132\%$$

$.4\%$

Percent Error Notes

Formula for Percent Error =

$$\frac{GPE}{\text{Measurement}}$$

Example: Identify the Percent Error of 42.3cm to the nearest tenth of a percent.

$$\frac{.05 \text{ cm}}{42.3 \text{ cm}} = .00118 = .118\% \rightarrow \boxed{.1\%}$$

1. 4.007 oz

$$\frac{.0005 \text{ oz}}{4.007 \text{ oz}} = .000124 \rightarrow \boxed{.0\%}$$

2. 15.6 in

$$\frac{.05 \text{ in}}{15.6 \text{ in}} = .003205 \rightarrow \boxed{.3\%}$$

3. 23 cm

$$\frac{.5 \text{ cm}}{23 \text{ cm}} = .0217 = 2.17\% \rightarrow \boxed{2.2\%}$$

4. 6.57 lbs

$$\frac{.005 \text{ lbs}}{6.57 \text{ lbs}} = .00076 = \boxed{.1\%}$$

5. 13.4 ft

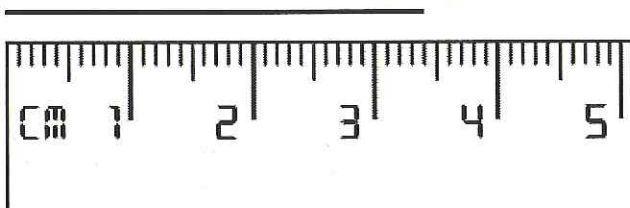
$$\frac{.05 \text{ ft}}{13.4 \text{ ft}} = .0037 \rightarrow \boxed{.4\%}$$

6. 13.445 cm

$$\frac{.0005 \text{ cm}}{13.445 \text{ cm}} = .0000371 \rightarrow \boxed{.0\%}$$

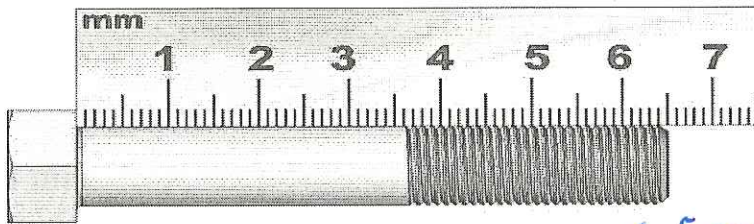
7. Identify the Percent Error of the line.

3.4 cm



$$\frac{.05 \text{ cm}}{3.4 \text{ cm}} = .0147 = \boxed{1.5\%}$$

8. Identify the Percent Error of the bolt.



6.5 mm

$$\frac{.05 \text{ mm}}{6.5 \text{ mm}} = .00769 = \boxed{.8\%}$$