

KEY

Problems

Give the number of significant figures in each of the following:

- | | | |
|-------------------------------|-----------------------|---------------------|
| <u>3</u> 402 m | <u>4</u> 34.20 lbs | <u>1</u> 0.03 sec |
| <u>3</u> 0.00420 g | <u>2</u> 3 200 liters | <u>3</u> 0.0300 ft. |
| <u>2</u> 5.1×10^4 kg | <u>2</u> 0.48 m | <u>4</u> 1 400.0 m |
| <u>7</u> 78 323.01 g | <u>3</u> 1.10 torr | <u>2</u> 760 mm Hg |

Multiply each of the following, observing significant figure rules:

$17 \text{ m} \times 324 \text{ m} = 5.5 \times 10^3 \text{ m}$
 $1.7 \text{ mm} \times 4\,294 \text{ mm} = 7.3 \times 10^3 \text{ mm}$
 $0.005 \text{ in} \times 8\,888 \text{ in} = 44 \text{ in}$
 $0.050 \text{ m} \times 102 \text{ m} = 5.1 \text{ m}$
 $0.424 \text{ in} \times .090 \text{ in} = 3.8 \times 10^{-2} \text{ in}$
 $324\,000 \text{ cm} \times 12.00 \text{ cm} = 3.89 \times 10^6 \text{ cm}$

Divide each of the following, observing significant figure rules:

$23.4 \text{ m} \div 0.50 \text{ sec} = 4.7 \times 10^1 \text{ m/sec}$
 $12 \text{ miles} \div 3.20 \text{ hours} = 3.8 \text{ mph}$
 $0.960 \text{ g} \div 1.51 \text{ moles} = 0.636 \text{ g/moles}$
 $1\,200 \text{ m} \div 12.12 \text{ sec} = 99 \text{ m/sec}$

Add each of the following, observing significant figure rules:

$3.40 \text{ m} + 0.022 \text{ m} + 0.5 \text{ m} = 3.9 \text{ m}$
 $102.45 \text{ g} + 2.44 \text{ g} + 1.9999 \text{ g} = 106.89 \text{ g}$
 $102. \text{ cm} + 3.14 \text{ cm} + 5.9 \text{ cm} = 111 \text{ cm}$

Subtract each of the following, observing significant figure rules:

$42.306 \text{ m} - 1.22 \text{ m} = 41.09 \text{ m}$
 $14.33 \text{ g} - 3.468 \text{ g} = 10.86 \text{ g}$
 $234.1 \text{ cm} - 62.04 \text{ cm} = 172.1 \text{ cm}$

Work each of the following problems, observing significant figure rules:

Three determinations were made of the percentage of oxygen in mercuric oxide. The results were 7.40%, 7.43%, and 7.35%. What was the average percentage?

$(7.40 + 7.43 + 7.35) \div 3 = 22.18 / 3 = 7.39\%$

A rectangular solid measures 13.4 cm x 11.0 cm x 2.2 cm. Calculate the volume of the solid.

$324.28 \rightarrow 3.2 \times 10^2 \text{ cm}$

If the density of mercury is 13.6 g/ml, what is the mass in grams of 3426 ml of the liquid?

$13.6 \text{ g/ml} \times 3426 \text{ ml} = 4.66 \times 10^4 \text{ g}$

A copper cylinder, 12.0 cm in radius, is 44.0 cm long. If the density of copper is 8.90 g/cm³, calculate the mass in grams of the cylinder. (assume pi = 3.14)

$\pi r^2 \times L = 19,895 \text{ cm}^3 \times \frac{8.90 \text{ g}}{1 \text{ cm}^3} = 1.77 \times 10^5 \text{ g}$

$(3.14) 12.0^2 \times 44.0 = 19,895$