

## SPH 3U MATH PRACTICE

1. Express the following numbers in STANDARD FORM :

a)  $217,000 = 2.17 \times 10^5$       b)  $0.00351 = 3.51 \times 10^{-3}$

Express the answer to this calculation in Standard form and with proper significance :

c)  $\frac{(259 \times 6189)}{\sqrt{0.58}} = 2.1 \times 10^6$       d)  $\sqrt{\frac{32.5}{6521}} + (0.051)^3 = 7.1 \times 10^{-2}$

2. Find the answers to the 2 following problems and express the answer to the correct number of significant digits. Don't forget to work out the units for each answer.

Find the force of gravity acting on Mr Shipman using the following equation :

$$F_g = \frac{6.67 \times 10^{-11} \frac{\text{Nm}^2}{\text{kg}^2} \times 5.98 \times 10^{24} \text{kg} \times 90 \text{kg}}{(6.371 \times 10^6 \text{m})^2} = 8.8 \times 10^2 = 900 \text{N}$$

$$\frac{\frac{\text{Nm}^2}{\text{kg}^2} \times \text{kg} \times \text{kg}}{\text{m}^2} = \frac{\text{Nm}^2}{\text{m}^2} = \text{N}$$

Find the power exerted by Mr. Shipman when he runs up a set of stairs in 3.28 seconds.

$$P = \frac{90 \text{kg} \times 9.803 \frac{\text{m}}{\text{s}^2} \times 2.65 \text{m}}{3.28 \text{s}} = 7.13 \times 10^2 = 700 \frac{\text{kgm}^2}{\text{s}^3}$$

$$\frac{\text{kg} \times \frac{\text{m}}{\text{s}^2} \times \text{m}}{\text{s}} = \frac{\text{kgm}^2}{\text{s}^2} \times \frac{1}{\text{s}} = \frac{\text{kgm}^2}{\text{s}^3}$$

3. Simplify the following expression to find the units of the answer :

$$\frac{\frac{\text{m}}{\text{s}^2} * \text{N} * \text{s}^3}{\frac{\text{N} * \text{s}}{\text{kg}} * \text{m}} = \frac{\frac{\text{m} \cdot \text{N} \cdot \text{s}^3}{\text{s}^2}}{\frac{\text{N} \cdot \text{s} \cdot \text{m}}{\text{kg}}} = \frac{\text{m} \cdot \text{N} \cdot \text{s}}{\text{m} \cdot \text{N} \cdot \text{s}} = \text{m} \cdot \text{N} \cdot \text{s} \times \frac{\text{kg}}{\text{m} \cdot \text{N} \cdot \text{s}} = \text{kg}$$