

AP Physics 1 — Summer Assignment

Metric Unit Conversions

Simple metric unit conversion

1) $52.3 \text{ g} = \text{_____ kg}$

PREFIXES		
Factor	Prefix	Symbol
10^{12}	tera	T
10^9	giga	G
10^6	mega	M
10^3	kilo	k
10^{-2}	centi	c
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p

Unit conversion of a unit in the denominator

2) $15 \text{ N/cm} = \text{_____ N/m}$

Unit conversion of units in numerator and denominator

3) $0.045 \text{ kN/cg} = \text{_____ N/g}$

Function Types & Proportional Reasoning

1. Use the equation for kinetic energy (on the right) to answer the questions.

- K and m have a _____ relationship.
- If you double the value of m , the value of K _____.
- K and v have a _____ relationship.
- If you double the value of v , the value of K _____.
- Sketch a graph that shows the functional relationship between K and v below. Label the axes.

$$K = \frac{1}{2}mv^2$$

2.

$$a_c = \frac{v^2}{r}$$

r is doubled. What happens to a_c ?

v is doubled. What happens to a_c ?

What kind of relationship do a_c and v have?

3.

$$\rho = \frac{m}{V}$$

V is doubled. What happens to ρ ?

V is halved. What happens to ρ ?

m is doubled. What happens to ρ ?

4.

$$|\vec{F}_g| = G \frac{m_1 m_2}{r^2}$$

r is doubled. What happens to F_g ?

G is doubled. What happens to F_g ?

m_1 and m_2 are both doubled. What happens to F_g ?

5.

$$T_s = 2\pi \sqrt{\frac{m}{k}}$$

m is doubled. What happens to T_s ?

m is increased by a factor of 4. What happens to T_s ?

k is increased by a factor of 4. What happens to T_s ?

Manipulating Equations

1. Solve this equation for x . (You can ignore the subscript x 's if you'd like.)

$$v_x^2 = v_{x0}^2 + 2a_x(x - x_0)$$

$$x =$$

3. Solve this equation for l :

$$T_p = 2\pi\sqrt{\frac{l}{g}}$$

$$l =$$

2. Solve this equation for v :

$$mgh = \frac{1}{2}mv^2$$

$$v =$$

4. Solve this equation for f :

$$x = A\cos(2\pi ft)$$

$$f =$$