

The following questions will assess your skill in several areas that will be essential to your success in Physics this year. Answer as many questions as you can and make note of areas that you may need to refresh.

Fill in the blanks for the following tables (1 pt per blank square)

**Grade:**

| Base Quantity |        | Base Unit |        |
|---------------|--------|-----------|--------|
| Name          | Symbol | Name      | Symbol |
| Time          | t      | Seconds   | s      |
| Distance      | d      | meter     | m      |
| mass          | m      | Kilogram  | kg     |
| Volume        | V      | Litre     | L      |

| Prefix | Symbol | Multiples of power |
|--------|--------|--------------------|
| Giga   | G      | $10^9$             |
| milli  | m      | $10^{-3}$          |
| Mega   | M      | $10^6$             |
| milli  | m      | $10^{-3}$          |
| Micro  | $\mu$  | $10^{-6}$          |
| Kilo   | K      | $10^3$             |

Convert the following metric measurements

- 2390 g = 2.39 Kg
- 4.5 mL = 4500  $\mu$ L
- 0.037 g = 37 mg
- $3.4 \times 10^3$  m = 3.4 Km
- $2.78 \times 10^{-5}$  L = 0.0278 mL
- $8.7 \times 10^4$  mg = 87,000 g

| Fill in the empty boxes with the correct answer |              |                        |                       |
|---|--------------|------------------------|-----------------------|
|   | Decimal Form | Scientific Notation    | Round to 3 Sig Figs   |
| (Leave blank)                                   | 83159.0      | $8.31590 \times 10^4$  | $8.32 \times 10^4$    |
|   | 0.0008063    | $8.063 \times 10^{-4}$ | $8.06 \times 10^{-4}$ |
| $864.4 \times 10^{-5}$                          | 0.008644     | $8.644 \times 10^{-3}$ | $8.64 \times 10^{-3}$ |
| $858.26 \times 10^4$                            | 8,582,600    | $8.5826 \times 10^6$   | $8.58 \times 10^6$    |

➤ Convert the following quantities, show working and units (5 pts)

6 foot 3 inches into cm (2.54 cm = 1 in)

365,000 seconds into days

$$\frac{6 \text{ foot}}{1 \text{ ft}} \times \frac{12 \text{ in}}{1 \text{ ft}} = 72 \text{ in} + 3 \text{ in} = 75 \text{ in}$$

$$\frac{75 \text{ in}}{1 \text{ in}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} = \boxed{190.5 \text{ cm}}$$

$$\frac{365,000 \text{ s}}{60 \text{ s}} \times \frac{1 \text{ min}}{60 \text{ min}} \times \frac{1 \text{ hr}}{24 \text{ hr}} = \boxed{42.25 \text{ day}}$$

Solve with your calculator with appropriate significant figures (5 pts)

$$\frac{1.05 \times 10^{-26}}{4.2 \times 10^{56}} = 2.5 \times 10^{-83}$$

$$(3.5 \times 10^3)(6.45 \times 10^{10})(3.498 \times 10^{-7}) = 7.8967 \times 10^7$$

$$= \underline{\underline{7.9 \times 10^7}}$$

Solve for x and show all working (5 pts)

$$5x - 7 = 11$$

$$5x = 18$$
$$x = \frac{18}{5}$$

$$3(x-5) = 12$$

$$x-5 = 4$$
$$x = 9$$

(3 pts)

The formula to convert Fahrenheit temperatures to Celsius is

$$C = 5 \frac{F - 32}{9}$$

What is the temperature in Celsius (C) when it is 50 - F?

$$C = \frac{5}{9} (50 - 32) = \frac{5}{9} (18) = 5(2) = 10^\circ C$$

(3 pts)

Choose an equation and solve for d:

$$d = v_i t + \frac{1}{2} a t^2$$

$$v_f^2 = v_i^2 + 2 a d$$

$$v_i = 8 \text{ m/s}$$

$$v_f = 0$$

$$t = 12 \text{ s}$$

$$v_f = v_i + a t$$

$$d = \frac{v_i + v_f}{2} t$$

$$d = \frac{v_i + v_f}{2} (t)$$
$$= \frac{8 + 0}{2} (12)$$
$$= 4 \cdot 12$$

$$= 48 \text{ m}$$

Rearrange the following equations and solve for the letter in **bold**, show working (10 pts)

$$PV = nRT$$

$$n = \frac{PV}{RT}$$

$$A = \frac{h}{2}(a + b)$$

$$\frac{2A}{h} = a + b$$

$$s = \frac{a}{1-r}$$

$$\frac{2A}{h} - a = b$$

$$s = vt - \frac{1}{2} at^2$$

$$(1-r)s = a$$

$$s - vt = -\frac{at^2}{2}$$

$$1-r = \frac{a}{s}$$

$$vt - s = \frac{at^2}{2}$$

$$r - 1 = -\frac{a}{s}$$

$$2(vt - s) = at^2$$

$$r = 1 - \frac{a}{s}$$

$$a = \frac{2(vt - s)}{t^2}$$