

Velocity Warm-Up finish for homework

Name: _____

1. Convert the following lengths into cm.

a) 150 mm = 15 cm

b) 2.3 m = 230 cm

c) 0.47 km = 47000 cm

2. Convert the following lengths into km.

a) 86 000 m = 86 km

b) 5 000 cm = 0.05 km

3. Convert into seconds.

a) 17 days = 1468800 s

b) 14 hrs = 50400 s

c) 3 min = 180 s

d) 4.5 min = 270 s

4. Convert into hours.

a) 3 600 sec = 1 h

b) 30 min = 0.5 h

c) 0.3 days = 7.2 h

5. Matt's bus is late for school! It is traveling down Mont Blue at an average speed of 35 km/h. How long will it take to get to school he is 0.7 km away from school?



$$v = \frac{d}{t} \quad \frac{35}{1} = \frac{0.7}{t}$$

$$0.02 \text{ h} \times 60 = 1.2 \text{ min}$$

$$x = 0.2 \text{ h}$$

$$1.2 \text{ min} \times 60 = 72 \text{ sec (60 + 12)}$$

~~$$t = \frac{d}{v} = \frac{0.7}{35} = 0.02 \text{ h}$$~~

$$t = \frac{d}{v} = \frac{0.7}{35} = 0.02 \text{ h}$$

1 minutes & 12 seconds

6. An "Angry Bird" is flying through the air. On average he flies a distance of 876 m in 36 seconds. What is his speed in km/h?

$$876 \div 1000 = 0.876 \text{ km}$$

$$v = \frac{d}{t} = \frac{0.876 \text{ km}}{0.01 \text{ h}} = 87.6 \text{ km/h}$$

$$36 \div 60 = 0.6 \text{ min}$$

$$0.6 \div 60 = 0.01 \text{ h}$$

7. An "Energy Star" lamp is found to consume 110 V and 0.9 A. It is used for 1 minute. If it is 86% efficient, how much energy is lost to heat? (assume that all the electrical energy is transformed into light or heat)

$$P = VI = 110 \times 0.9 = 99 \text{ W}$$

$$\% E \text{ efficiency} = \frac{\text{useful } E}{\text{consumed } E} \times 100$$

$$E = P \Delta t = 99 \times 60 = 5940 \text{ J}$$

$$\frac{86}{100} = \frac{x}{5940}$$

$$x = 5108.4 \text{ J}$$

$$\begin{array}{r} 5940 \\ - 5108.4 \\ \hline 831.6 \text{ J} \end{array}$$

8. A gear train (many gears lined up) loses a lot of energy due to tiny imperfections in the gears. What is the energy efficiency of this system, if 3 600 J of energy is put into the system and 785 J is lost as the gears slip?

$$\% E \text{ efficiency} = \frac{\text{used}}{\text{consumed}} \times 100$$

$$\begin{array}{r} 3600 \\ - 785 \\ \hline 2815 \end{array}$$

$$= \frac{2815}{3600} \times 100$$

% efficiency 78.2%