

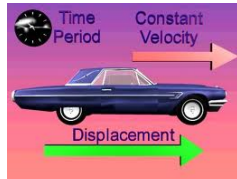
Constant Velocity Equations

Constant Velocity Equation

Objectives

Use constant velocity equations to calculate distance, velocity, and time.

Use dimensional analysis to convert units.



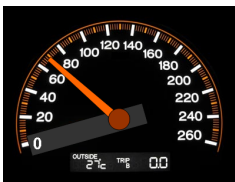
Constant Velocity

(No Acceleration)

$$v = \frac{\Delta d}{\Delta t}$$

OR

$$\Delta d = v \cdot t$$



$$v = 70 \text{ mi/hr}$$

$$t = 25 \text{ min}$$

$$d = ?$$

$$\Delta d = v \cdot t \quad \Delta d = 70 \text{ mi/hr} \cdot .42 \text{ hr} = \boxed{29 \text{ mi}}$$

$$\frac{25 \text{ min}}{1} \cdot \frac{1 \text{ hr}}{60 \text{ min}} = .42 \text{ hr}$$

Velocity Problem

The distance from Sioux Falls to Rapid City is 347 miles. How long will the trip take if you average 75 mph?

$$v = \frac{\Delta d}{t}$$

$$t = \frac{\Delta d}{v} \quad \frac{347 \text{ mi}}{75 \text{ mph}} = 4.6 \text{ hr or } 4 \text{ hr } 36 \text{ min.}$$

$$\frac{.6 \text{ hr}}{1} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = 36 \text{ min.}$$



Dimensional Analysis

1. 1200 km = _____ m (1 km = 1000 m)

$$\frac{1200 \text{ km}}{1} \cdot \frac{1000 \text{ m}}{1 \text{ km}} = 1,200,000 \text{ m}$$

2. 745 cm = _____ m (1 m = 100 cm)

$$\frac{745 \text{ cm}}{1} \cdot \frac{1 \text{ m}}{100 \text{ cm}} = 7.45 \text{ m}$$

3. 75 miles = _____ km (1 km = 0.62 mi.)

$$\frac{75 \text{ mi}}{1} \cdot \frac{1 \text{ km}}{0.62 \text{ mi}} = 120.97 \text{ km}$$

4. 17 gallons = _____ L (1 gallon = 3.8 L)

$$\frac{17 \text{ gal}}{1} \cdot \frac{3.8 \text{ L}}{1 \text{ gal}} = 64.6 \text{ L}$$

5. 35 years = _____ seconds (answer in scientific notation)

$$\frac{35 \text{ yr}}{1} \cdot \frac{365 \text{ day}}{1 \text{ yr}} \cdot \frac{24 \text{ hr}}{1 \text{ day}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{60 \text{ s}}{1 \text{ min}} = 1.10376 \times 10^9 \text{ sec}$$

Assignments . . .



- Chapter 1 Homework #16 - 20

