

Lesson 1: Speed and Velocity

Keywords: Speed, Velocity

Speed and Velocity

What is meant by the terms:

Speed?

is just how fast you are going with no regard to the direction.

Velocity?

Must have the direction specified as well as the speed.

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Are these examples of speed or velocity?

30 mph

Speed

30 km/h
north

Velocity

15 cm/s

Speed

10 m/s,
 060°

Velocity

So:

Speed and velocity are both measured in the same units and say how fast you are going.

Velocity though gives you the direction too.

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You need to be able to calculate the speed of an object.
What do you need to know? (think about the units of speed).

How far something has travelled - **distance**

How long it took to travel that distance - **time**.

Remember: Speed is measured
in mph, km/h, m/s, cm/s

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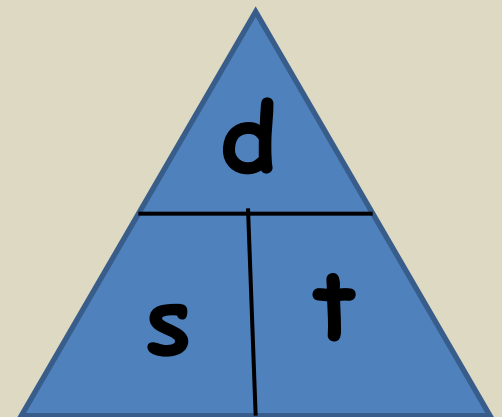
Speed and Velocity

So the formula to work out speed is:

Remember: Speed is measured in mph,
km/h, m/s, cm/s

So the answer is in the units:

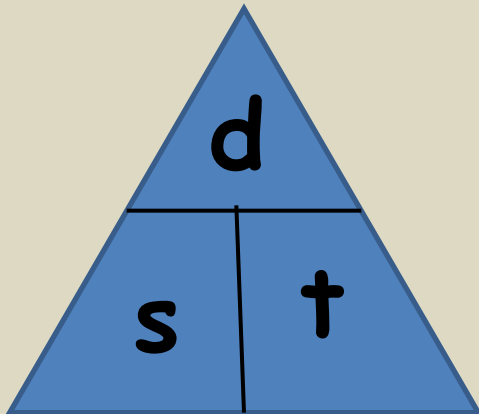
$$\frac{\text{Distance}}{\text{Time}} = \text{Speed}$$



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So the formulas are:



$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

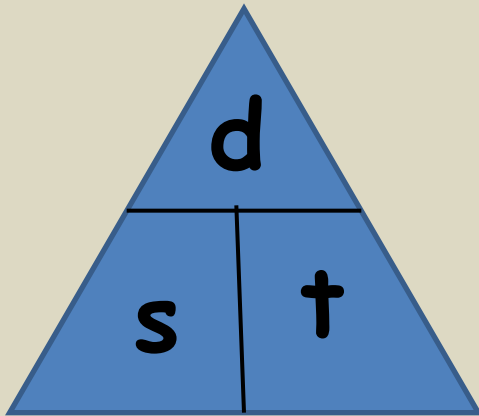
$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\text{Distance} = \text{Speed} \times \text{Time}$$

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Lets use the formulas:



1. A cat walks 20m in 35s. Find:
 - a. Its speed
 - b. How long it takes to walk 100m

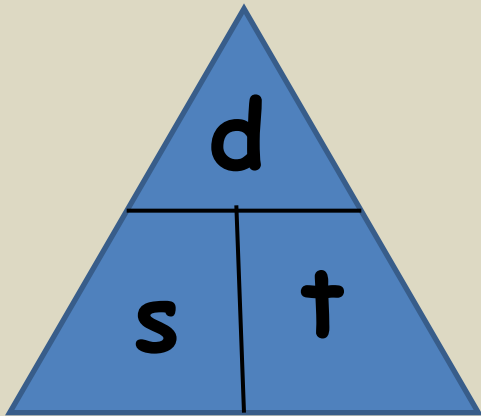
$$1a. \text{ Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{20\text{m}}{35\text{s}}$$

Answer: 0.57 m/s (remember units)

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Lets use the formulas:



1. A cat walks 20m in 35s. Find:
 - a. Its speed
 - b. How long it takes to walk 100m

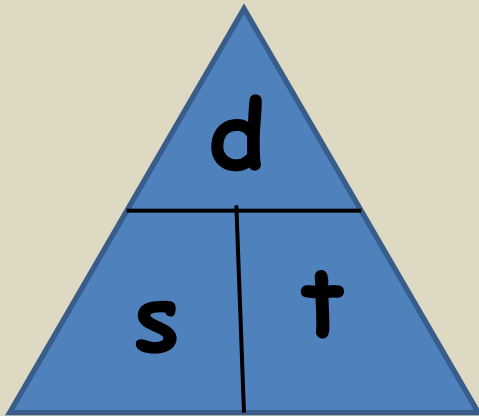
$$1b. \text{ Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{100\text{m}}{0.57\text{m/s}}$$

Answer: 175s (remember units)

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Lets use the formulas:



To calculate velocity, we use the same formula.

All that we would need to add is the direction that the cat was walking.

Velocity = distance/time

1. If a person is walking at 4 m/s, how far can he travel in 30 seconds?

- a) 120 meters b) 7.8 meters c) .08 meters

2. A spaceship can move 100 meters in 2 seconds. What is the ship's velocity?



- a) 200 m/s b) 50 m/s c) .002 m/s

3. A chicken runs across the street at a speed of 12 m/s. If the road is 36 meters across, how long does it take for the chicken to cross the road?



- a) 3 s b) 432 s c) .333 s

A car travels a distance of 500 m in 10 sec. What is the car's speed?

$$v = s/t$$



A second car travels a distance of 100 meters in 20 seconds. What is this car's speed?