

# 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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# Speed and Velocity

Are these examples of speed or velocity?

30 mph

Speed

30 km/h  
north

Velocity

15 cm/s

Speed

10 m/s,  
 $060^\circ$

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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# Speed and Velocity

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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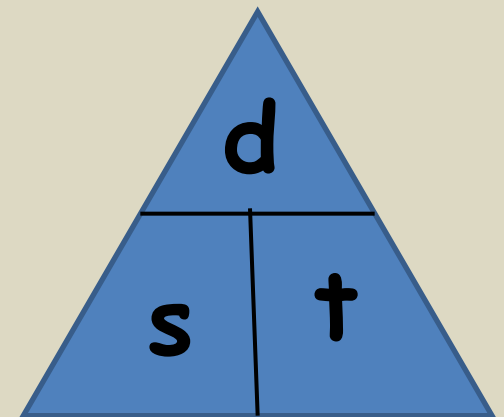
# Speed and Velocity

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:

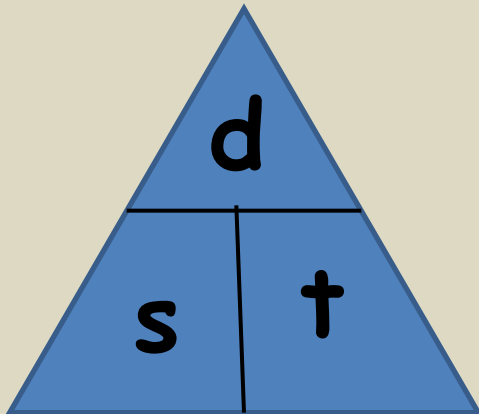
$$\frac{\text{Distance}}{\text{Time}} = \text{Speed}$$



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# Speed and Velocity

So the formulas are:



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

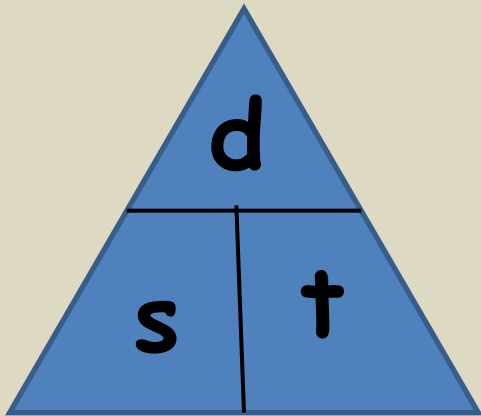
$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

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

Keywords: Speed, Velocity, Acceleration,

# Speed and Velocity

Lets use the formulas:



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

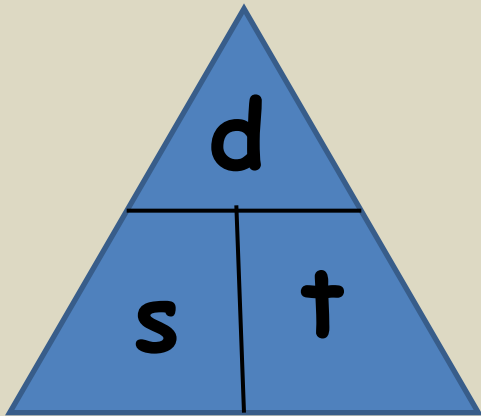
$$1a. \text{ Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{20\text{m}}{35\text{s}}$$

Answer: 0.57 m/s (remember units)

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# Speed and Velocity

Lets use the formulas:



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

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

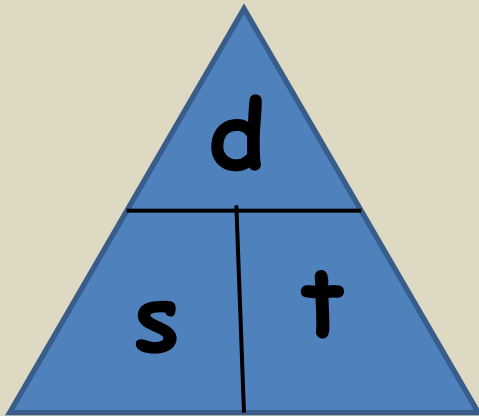
Answer: 175s (remember units)



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# Speed and Velocity

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?