

Lesson #6

Uniform Motion

An object is in _____ when it moves without changing its speed, or rate. The examples illustrate three types of problems involving uniform motion. Each is solved using a chart, a sketch, and the distance formula.

Distance	=	Rate	x	Time
Miles		mi/h		hours
Kilometers		k/h		hours

Example 1: Motion in Opposite Directions

Two camper vans leave Arrowhead Lake at the same time, one traveling north at a speed of 10 km/h faster than the other which is traveling south. After 3 hours, the camper vans are 420 km apart. Find their speeds.

When two objects traveling in opposite directions meet, their distances will _____ to equal the total distance.

Example 2: Motion in the Same Direction (Overtake)

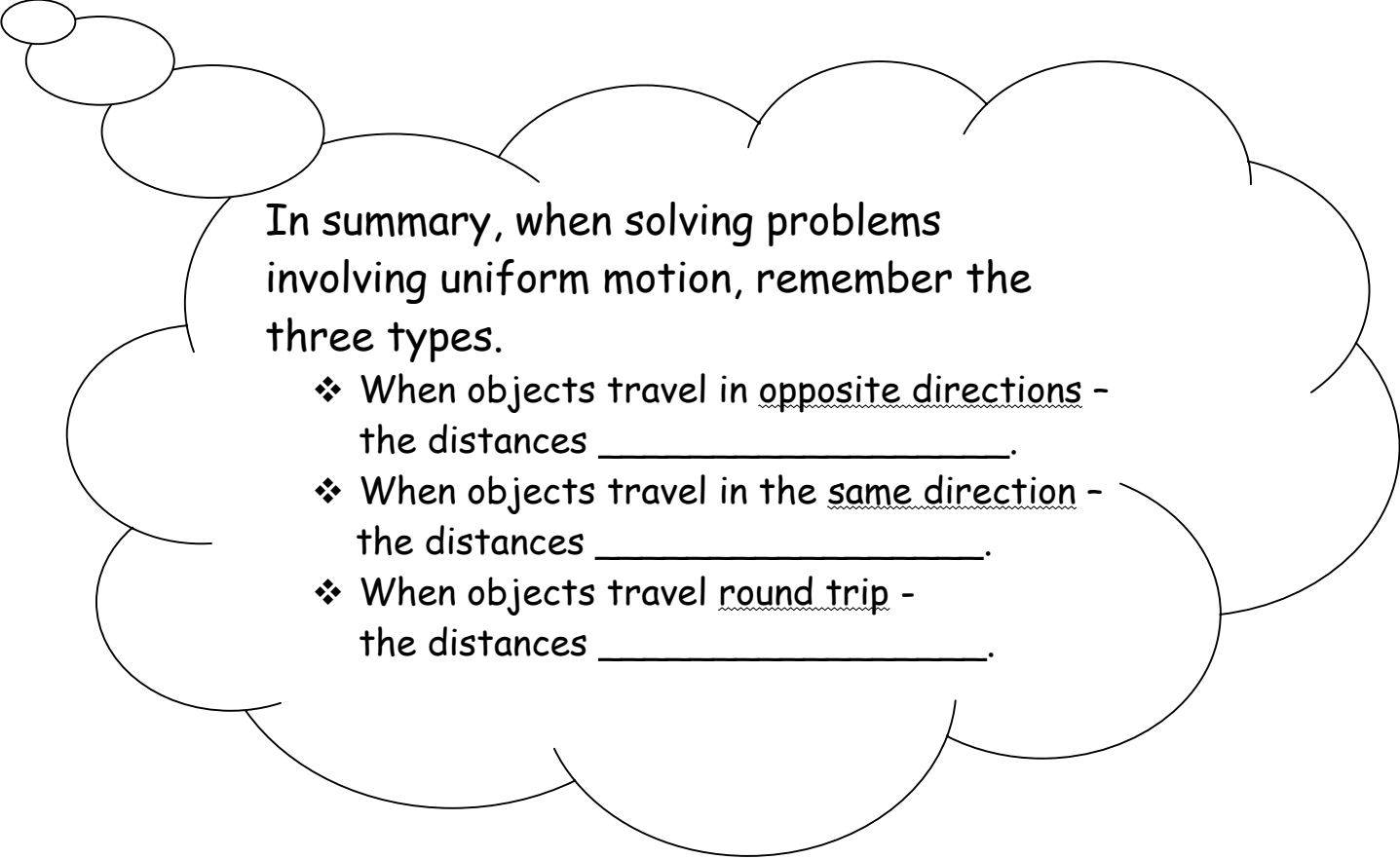
A tourist bus leaves Richmond at 1:00 p.m. for New York City. Exactly 24 minutes later, a truck sets out in the same direction. The tourist bus moves at a steady 60 km/h. The truck travels at 80 km/h. How long does it take the truck to overtake the tourist bus?

When two objects travel in the same direction, their distances will be _____ when the second overtakes the first.

Example 3: Round Trip

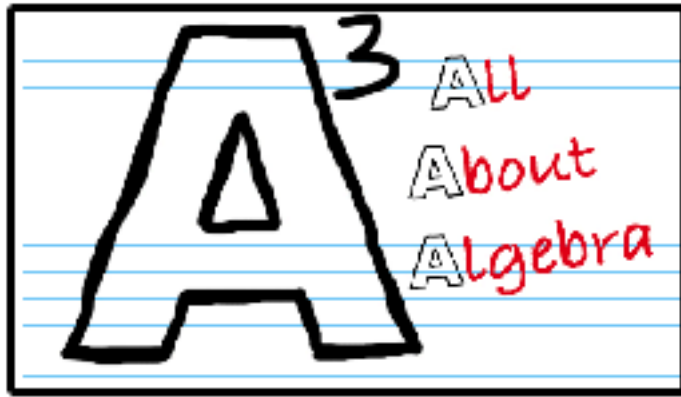
It takes a plane 1 hour less to fly from San Diego to New Orleans at 600 km/h than it does to return at 450 km/h. How far apart are the two cities?

When traveling round trip, the distances of two objects will be _____.



In summary, when solving problems involving uniform motion, remember the three types.

- ❖ When objects travel in opposite directions - the distances _____.
- ❖ When objects travel in the same direction - the distances _____.
- ❖ When objects travel round trip - the distances _____.



Just for FUN!

Solution

The formula for the volume of a pyramid with a square base is

$$V = \frac{1}{3}hs^2$$

where h is the height of the pyramid and s is the length of each side of the base.



1. Solve the formula for h .

$$V = \frac{1}{3}hs^2$$

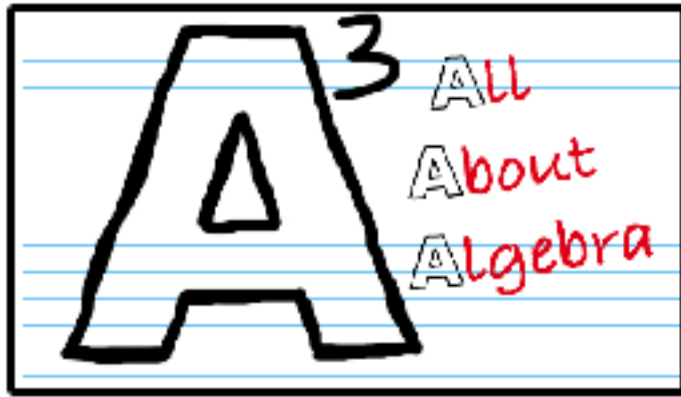
$$3V = hs^2$$

$$\frac{3V}{s^2} = \frac{hs^2}{s^2}$$

$$\frac{3V}{s^2} = h$$

2. The Great Pyramid in Egypt has a volume of about 90 million cubic feet and a square base with sides of about 750 feet. Use the formula for h to approximate the height of the Great Pyramid.

$$\frac{3(90,000,000)}{(750)^2} = h \quad 480 \text{ ft.} = \text{height}$$



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Jack and Jill

Jack and Jill went up the hill
To fetch a pail of water (at a walking speed of 2 mi/h).
Jack fell down and broke his crown
And Jill came tumbling after (at a falling speed of 5 mi/h).

If the total time for this fascinating adventure was 6 hours, how far up the hill did Jack and Jill go?
