

Date _____

More steps to solve variation problems

If you need to take the additional steps we did before, please do so. The following four steps are the ones that you should be doing at a minimum.

1. Underline the sentence that you will be translating & identify the type of variation
2. Clearly define your variables. (from last handout)
3. Solve for k and give the general formula. (from last handout)
4. Solve the problem. Show your work and write your answer in a complete sentence.

The **amount of gas that a helicopter uses is directly proportional to the number of hours spent flying**. The helicopter flies for 2 hours and uses 18 gallons of fuel. **Find the number of gallons of fuel that the helicopter uses to fly for 4 hours.**

Type of variation:	direct variation ($y = kx$)
Variables:	Let g = amount of gas that a helicopter uses Let h = number of hours spent flying
General Formula:	$18 = k \cdot 2$ $\frac{18}{2} = \frac{k \cdot 2}{2}$ $k = 9$ $g = 9h$
Solve:	Find <u>number of gallons of fuel</u> that the helicopter uses to fly for <u>4 hours</u> Find g when $h = 4$ $g = 9 \cdot (4)$ $g = 36$
Answer:	When the helicopter flies for four hours, it uses 36 gallons of fuel.

When the temperature stays the same, the **volume of a gas is inversely proportional to the pressure of the gas**. If a balloon is filled with 250 cubic inches of a gas at a pressure of 14 pounds per square inch, **find the new pressure of the gas if the volume is decreased to 50 cubic inches.**

Type of variation:	inverse variation ($y = \frac{k}{x}$)
Variables:	Let v = volume of gas Let p = pressure of gas
General Formula:	$250 = \frac{k}{14}$ $14 \cdot 250 = \frac{k}{14} \cdot 14$ $k = 3500$ $v = \frac{3500}{p}$
Solve:	Find the new <u>pressure of the gas</u> if <u>the volume is decreased to 50</u> cubic inches. Find p when $v = 50$ $50 = \frac{3500}{p}$ $\frac{50}{1} = \frac{3500}{p}$ $50p = 3500 \cdot 1$ $p = 70$
Answer:	If the volume of gas is decreased to 50 cubic inches, the pressure will be 70 pounds per square inch.

Date _____

The amount of time it takes a swimmer to swim a race is inversely proportional to the average speed of the swimmer. A swimmer finishes a race in 120 seconds with an average speed of 5 feet per second. Find the average speed of the swimmer if it takes 150 seconds to finish the race.

Type of variation:	
Variables:	
General Formula:	
Solve:	
Answer:	

The distance that an object falls when it is dropped is directly proportional to the square of the amount of time since it was dropped. An object falls 288 feet in 3 seconds. Find the distance the object falls in 5 seconds.

Type of variation:	
Variables:	
General Formula:	
Solve:	
Answer:	