## Formulas:

Ex: In a electric circuit the total resistance, R, of two resistors$,R\_{1}\&R\_{2},$ connected in parallel is given by

$$\frac{1}{R}=\frac{1}{R\_{1}}+\frac{1}{R\_{2}}$$

Solve this formula for $R$.

Ex: A the position of a weight hung on a spring with a particular spring rate of k, can be given by Hooks Law:

$$d=kx$$

Solve this for k.

Ex: 6.8.36 The average acceleration of a body in motion is given by the formula

$$a=\frac{v\_{2}-v\_{1}}{t\_{2}-t\_{1}}$$

Solve this for $t\_{2}$

## Variation:

### Direct Variation:

When a situation is modeled by a linear function of the form $f\left(x\right)=kx, or y=kx,$ where k is a nonzero constant, we say that there is *direct variation*, that $y$ *varies directly as* $x$, or that y is *Proportional to* $x$. The number k is called the variation constant, or constant of proportionality.

### Inverse Variation:

When a situation is modeled by a linear function of the form $f\left(x\right)=\frac{k}{x}, or y=\frac{k}{x},$ where k is a nonzero constant, we say that there is *inverse variation*, that $y$ *varies inversely as* $x$, or that y is *inversely proportional* to $x$. The number k is called the variation constant, or *constant of proportionality*.

### Joint Variation:

$y$ varies *jointly* as $x \& z$ if, for some nonzero constant k, $y=kxz$

Ex: 6.8.55 Hookes Law states that the distance $d$ a spring is streched by a haning object varies directly as the mass $m$ of the object. If the distance is 20 cm whn the mass is 3 kg, what is the distance when the mass 5 kg.

Ex: 6.8.66 The electric current I, in amperes, in a electric circuit varies inversely as the resistance R of the conductor. If the current is ½ ampere when the resistance is 240 ohms, what is the current when the resistance is 540 ohms?

Ex: 6.8.63 The frequency of a string is inversely proportional to its length. A violin string that is 33 cm long vibrates with a frequency of 260 Hz. What is the frequency when the string is shortened to 30 cm?

Ex: $\~$6.8.82 The drag force F on a body varies jointly as the contacted surface area A and the square of the velocity of the body. If a downhill bike racer traveling 10 meters per hr experiences a drag force of 400 N when the contacted surface is 4 $m^{2}$, find the drag force of the down hill racer traveling at 30 meters per hr with a more aero position giving the racer a surface area of 3 $m^{2}$?