5.4 – Direct Variation

Direct Variation: y **varies directly** as x
This means as x increases, y increases
as x decreases, y decreases

Hrs worked	5	11	14	17
Pay	\$30.00	\$66.00	\$84.00	\$102.00

How would you find the constant rate? $\frac{30}{5} = 6$
divide pay by hours worked

General Equation for direct variation: $\frac{y}{x} = \frac{y}{x}$

1. If y varies directly as x and $y = 6$ when $x = 8$, find y when $x = 12$.

$\frac{y}{x} = \frac{y}{x}$ $\quad \frac{6}{8} = \frac{y}{12}$ $\quad 8y = 72$ $\quad y = 9$

Cross multiply!

2. The force required to stretch a spring, F, varies directly with the amount the spring is stretched, s. Ten pounds is needed to stretch a spring 8 inches. How many pounds would be needed to stretch the spring 32 inches?

$\frac{F}{s} = \frac{F}{s}$ $\quad \frac{10}{8} = \frac{F}{32}$ $\quad 8F = 320$ $\quad F = 40$ pounds

3. The distance, d, varies directly with the time, t. If you have driven 175 miles for 5 hours. How long would you drive for 210 miles?

$\frac{d}{t} = \frac{d}{t}$ $\quad \frac{175}{5} = \frac{210}{t}$ $\quad 175t = 1050$ $\quad t = 6$ hours

Don't forget units!