5.3 Rate of Change and Direct Variation

rate of change = speed

$$\text{rate} = \frac{\text{change in distance}}{\text{change in time}} = r = \frac{d}{t}$$

Side note:

Δ (delta) = change in

How does slope of a line relate to rate of change?

A steeper slope means faster rate.
Horizontal line means standing still
Negative slope means moving backward.

<u>Direct variation</u> is one type of rate of change.

As one variable goes up, the other one goes up.

$$\boxed{y = kx}$$

Where k = constant

How do we find the constant?
Solve for k.

$$\boxed{\frac{y}{x} = k}$$

Examples of real life direct variation:
- Study time / grade
- Height of H_2O in glass / ounces
- others?

"If y varies directly as 'x", then use $y = kx$

Examples:

If y varies directly as x and $x = 6$ when $y = 27$, find x when $y = 45$.

2 ways.

Proportion

$\frac{y}{x} = \frac{y}{x}$ $\quad \frac{27}{6} = \frac{45}{x}$

$27x = 270$
$x = 10$

finding Constant

Equation of D.V.

$y = \frac{27}{6}x$

$27 = 6k$
$k = \frac{27}{6}$

$45 = \frac{27}{6}x$
$x = 10$

HW: Pg 241 (7, 9, 11, 13, 19, 23, 27)
Pg 241 (1-28 Evens)