9/23 Proportional Relationships

relationship between two quantities in which the ratio of one quantity to the other is constant (equal fractions)

Equation: $y = kx$ k = constant of proportionality

$k = y/x$

Graph: a proportional relationship is a line passing through the origin

Rate of change: amount of change in the dependent variable, y, to the amount of change in the independent value, x (slope)

Slope: $\frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$

Ex: $(2, 3)$, $(5, 7)$ $\quad \frac{7-3}{5-2} = \frac{4}{3}$

x_1, y_1 $\quad x_2, y_2$

positive slope ↗

negative slope ↘

Unit rate: a rate with the second quantity is one unit

In a proportional relationship:

constant of proportionality = slope = unit rate

To solve for unit rate/slope in a...

Table: ratio of y/x, when $x = 1$

y = unit rate/slope → divide

Equation: $y = kx$ k = unit rate/slope

Graph: when it passes through the origin, look at $x = 1$, y = slope/unit rate

or $\frac{\Delta y}{\Delta x}$ or $\frac{\text{rise}}{\text{run}}$ ↕ →