UNIT 3 LESSON 4 **DIRECT/INVERSE VARIATION**

Direct Variation "y varies directly as x"

- Represented by the equation $y = kx$

- Graphs always pass through the origin (no y-intercept)

- k is the constant of variation (slope)

Name the CONSTANT of VARIATION for each equation.

Ex 1) y = 8x constant of variation = 8

Ex 2) y = -5x constant of variation = -5

Inverse Variation "y varies inversely as x"

- Represented by the equation $y = \frac{k}{x}$

Ex 3) If y varies directly as x^2, and y = 8 when x = 2, find y when x = 1.

Use the direct variation formula $y = kx^2$
$8 = k\,(2)^2$
$k = 2$
find y when x = 1..... $y = 2(1)^2$
$y = 2$

Ex 4) If y varies inversely with x, when y = 40 and x = 16, find x when y = -5.

Use the inverse variation formula $y = \frac{k}{x}$

$40 = \frac{k}{16}$

$k = 640$

find x when y = -5..... $-5 = \frac{640}{x}$

$x = -128$

Ex 5) The distance needed to stop a car varies directly as the square of its speed. It requires 120 m to stop a car at 70 km/h. What distance is required to stop a car at 80 km/h?

Use the direct variation formula $y = kx^2$.....y is the distance, x is the square of its speed

$120 = k\,(70)^2$

$k = 0.0244$

Distance required to stop car at 80 km/h?.....$y = (0.0244)\,(80)^2$

y = 156 m