Writing Linear Equations

Slope – Intercept Form

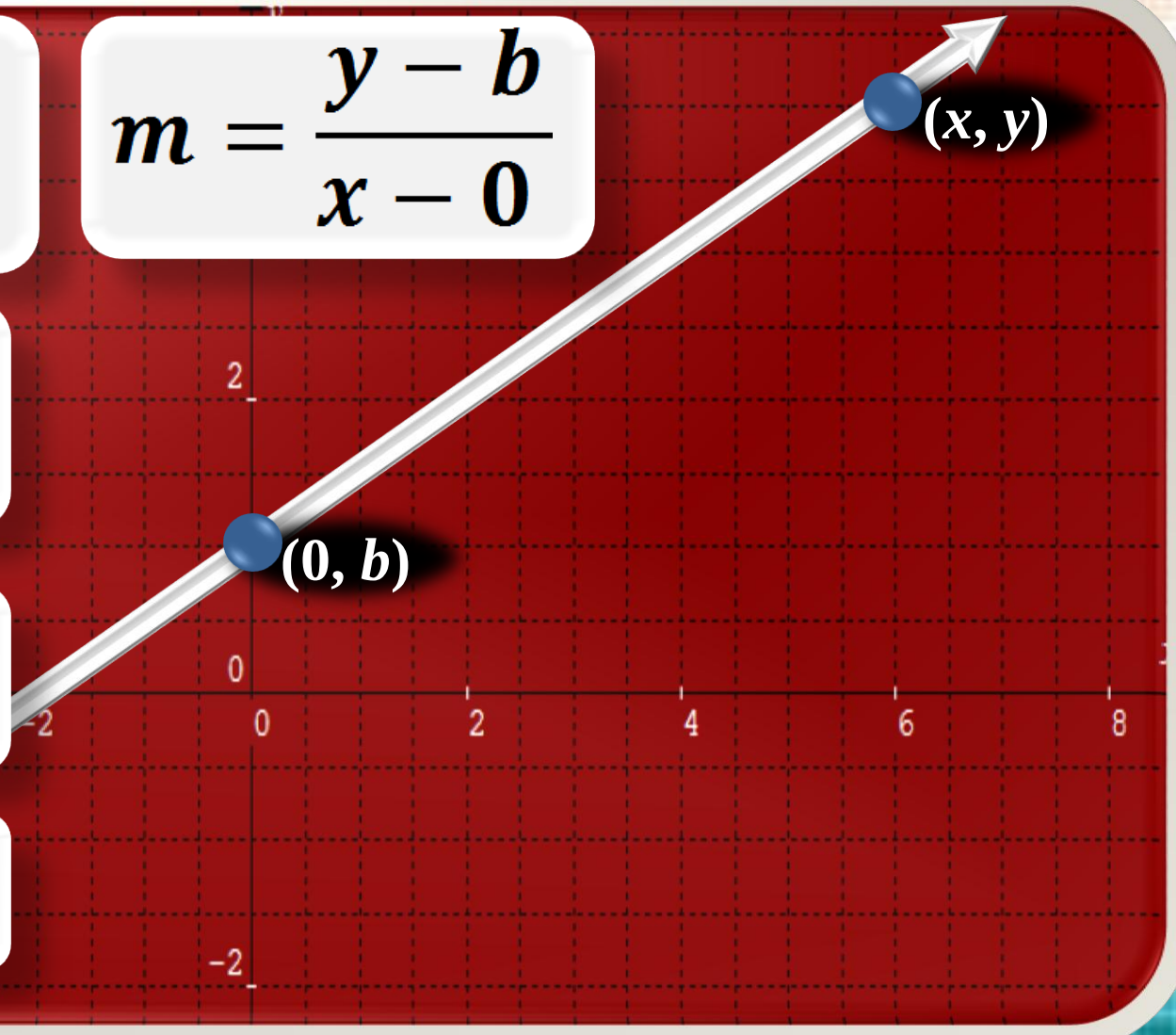
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{y - b}{x - 0}$$

$$m = \frac{y - b}{x}$$

$$mx = y - b$$

$$y = mx + b$$

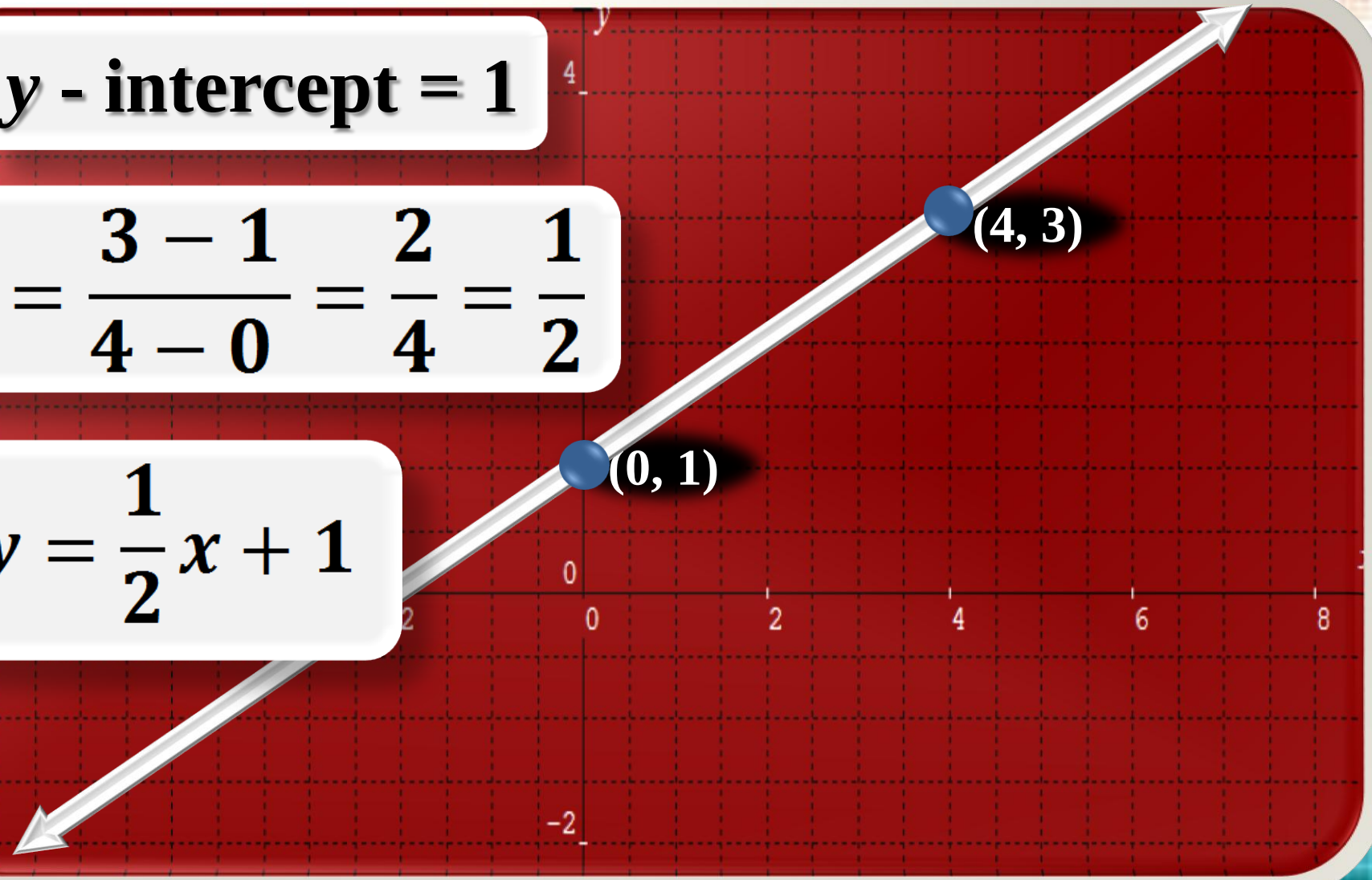


Slope – Intercept Form

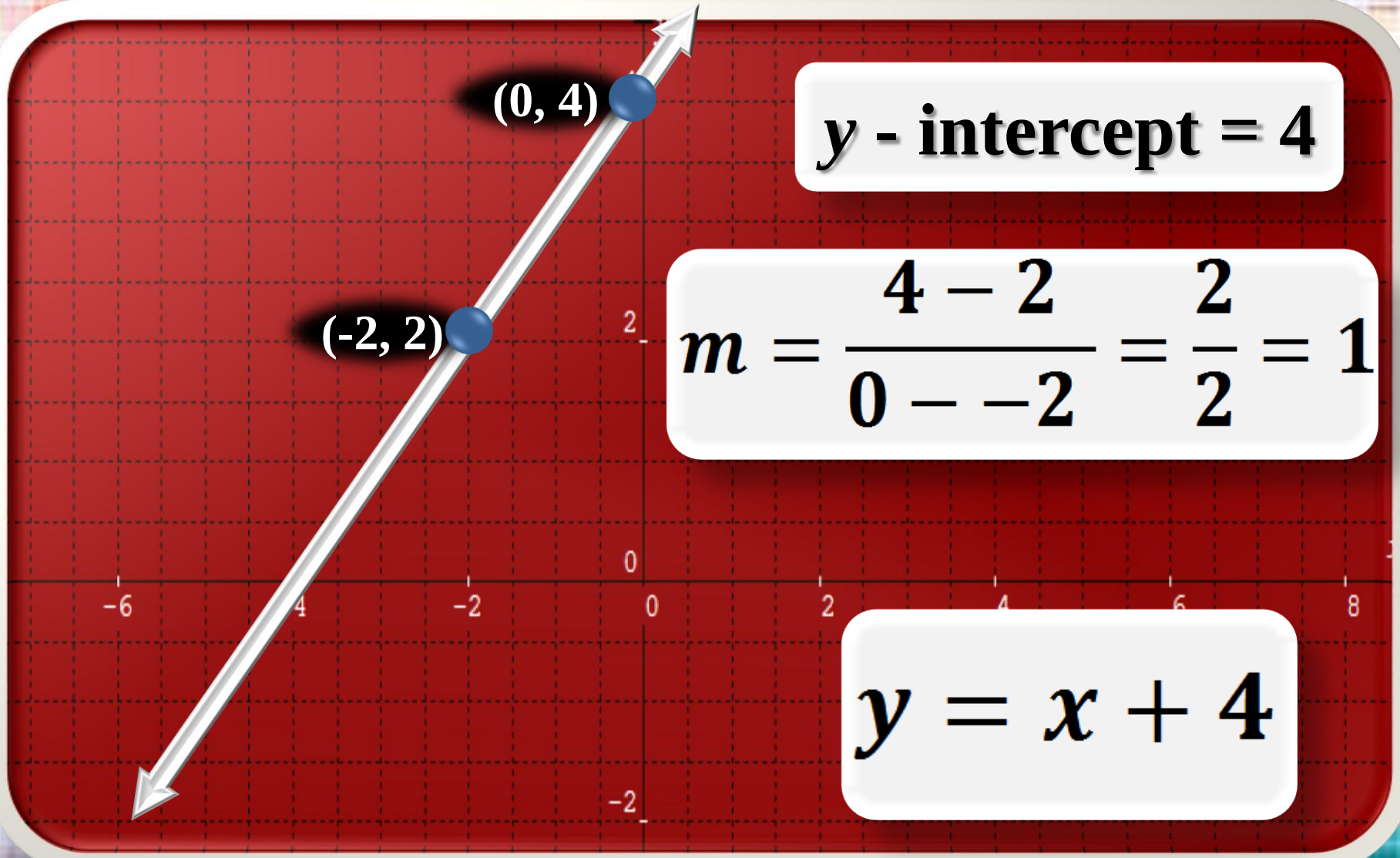
y - intercept = 1

$$m = \frac{3-1}{4-0} = \frac{2}{4} = \frac{1}{2}$$

$$y = \frac{1}{2}x + 1$$



Slope – Intercept Form

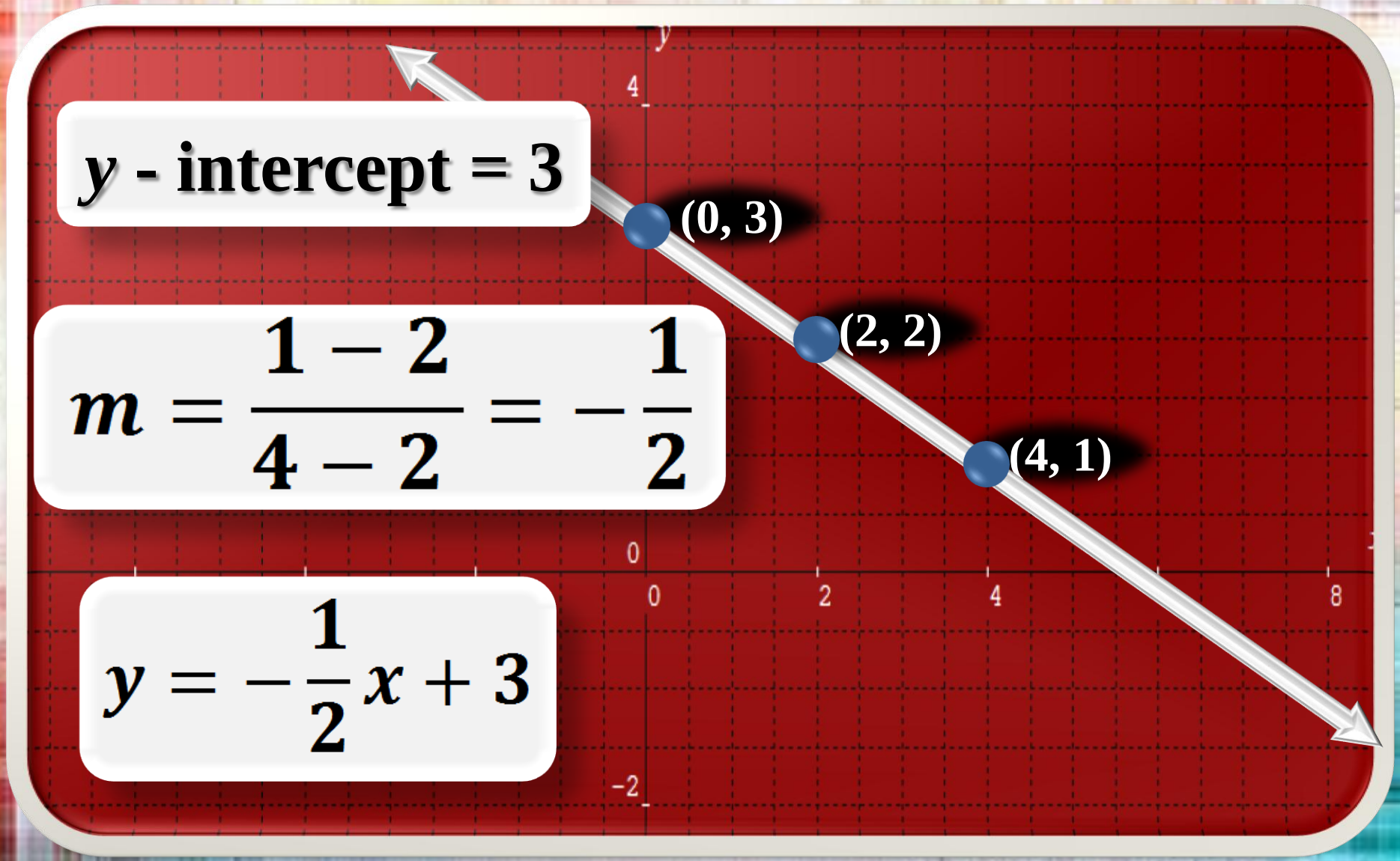


y - intercept = 4

$$m = \frac{4 - 2}{0 - -2} = \frac{2}{2} = 1$$

$$y = x + 4$$

Slope – Intercept Form



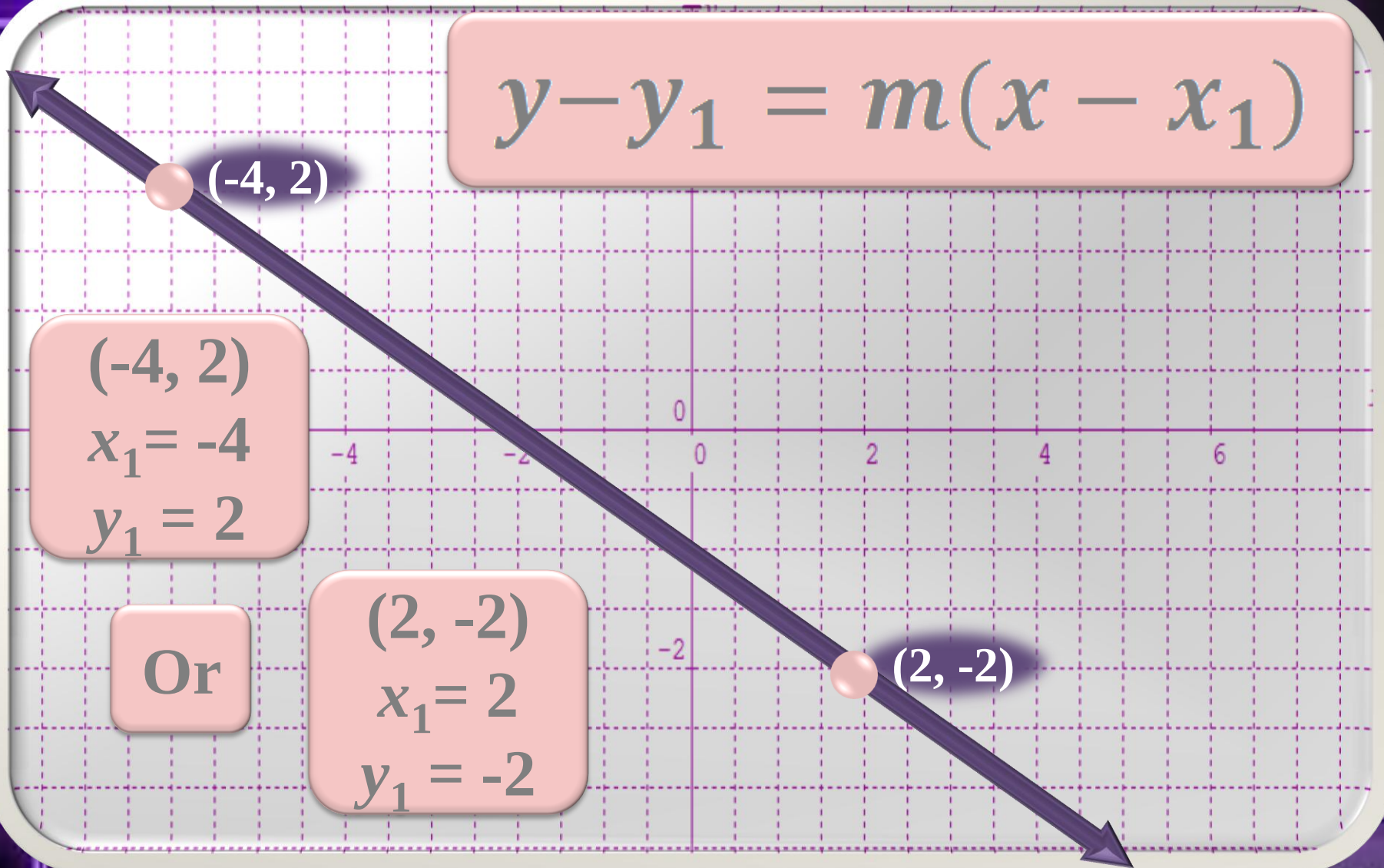
y - intercept = 3

$$m = \frac{1-2}{4-2} = -\frac{1}{2}$$

$$y = -\frac{1}{2}x + 3$$

Point - Slope Form

$$y - y_1 = m(x - x_1)$$



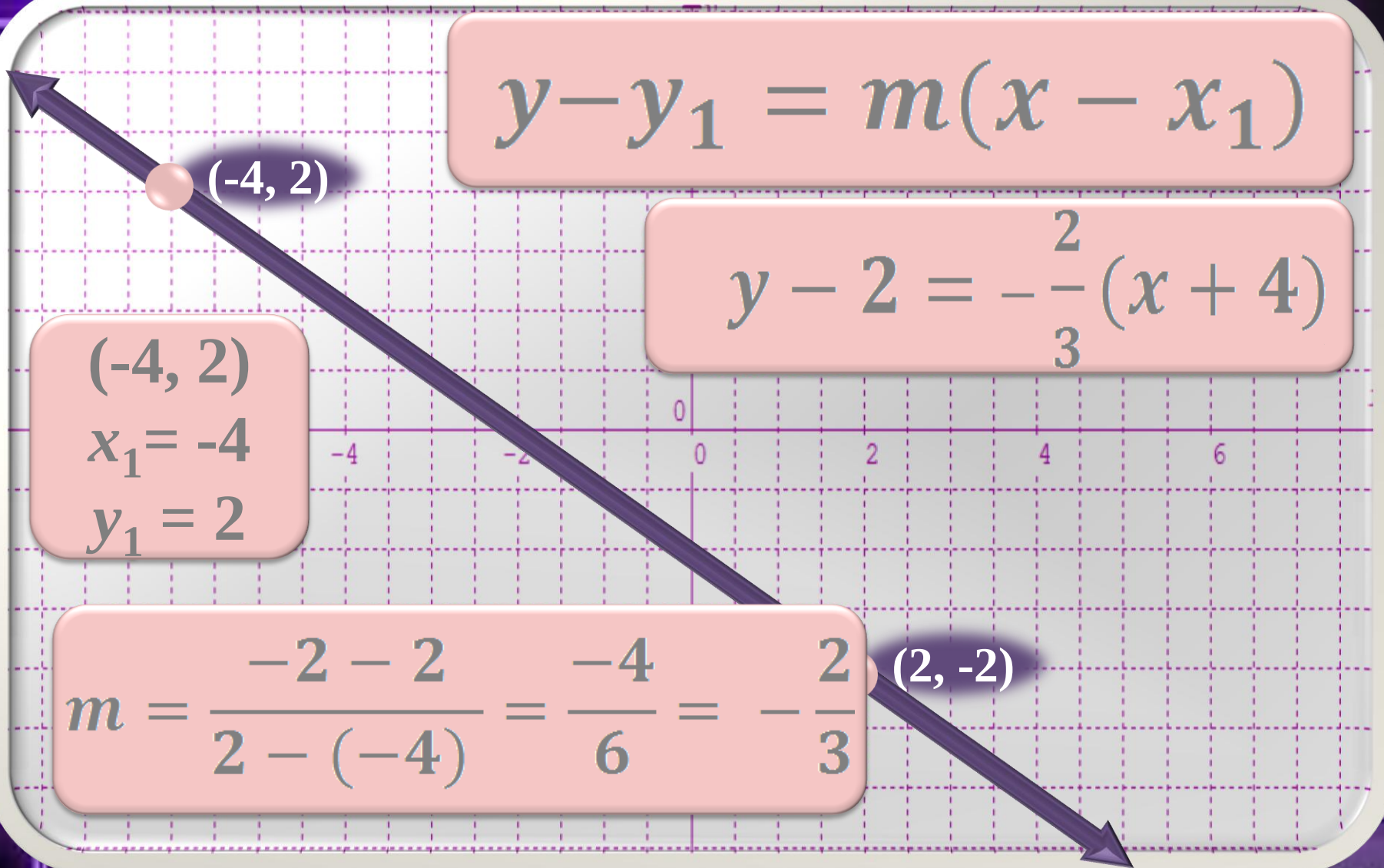
(-4, 2)
$x_1 = -4$
$y_1 = 2$

Or

(2, -2)
$x_1 = 2$
$y_1 = -2$

Point - Slope Form

$$y - y_1 = m(x - x_1)$$



$$y - 2 = -\frac{2}{3}(x + 4)$$

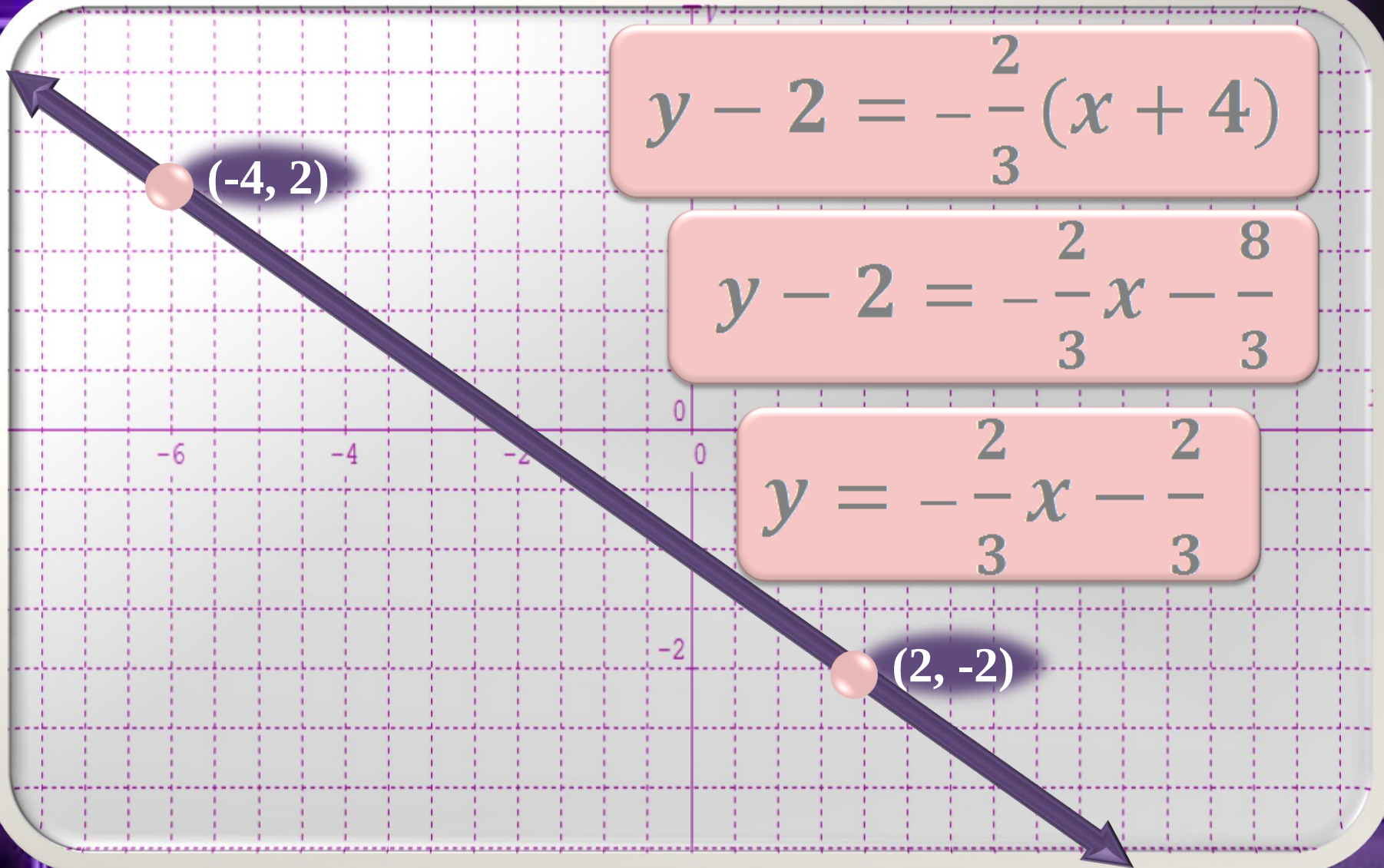
(-4, 2)

$x_1 = -4$

$y_1 = 2$

$$m = \frac{-2 - 2}{2 - (-4)} = \frac{-4}{6} = -\frac{2}{3}$$

Point - Slope Form

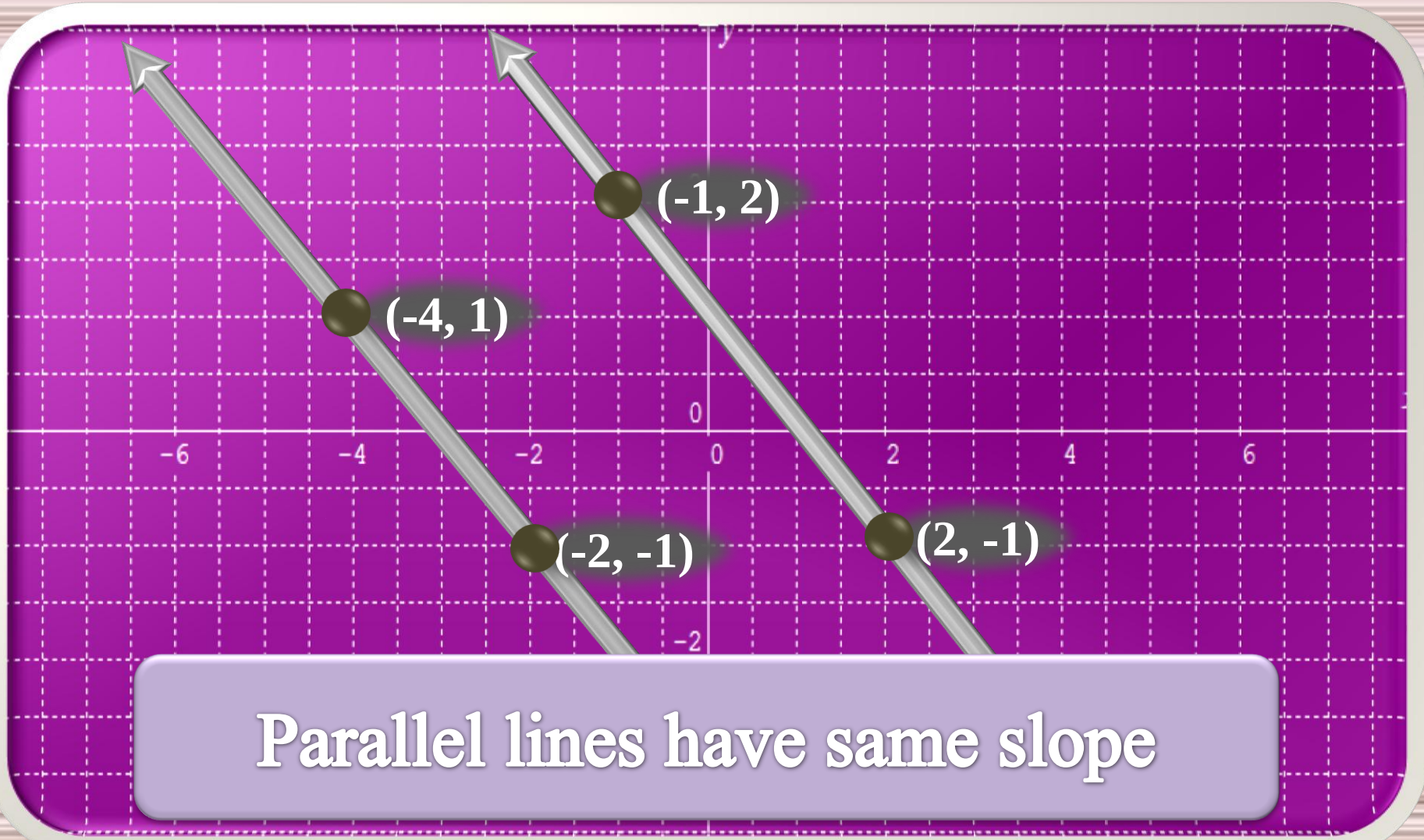


$$y - 2 = -\frac{2}{3}(x + 4)$$

$$y - 2 = -\frac{2}{3}x - \frac{8}{3}$$

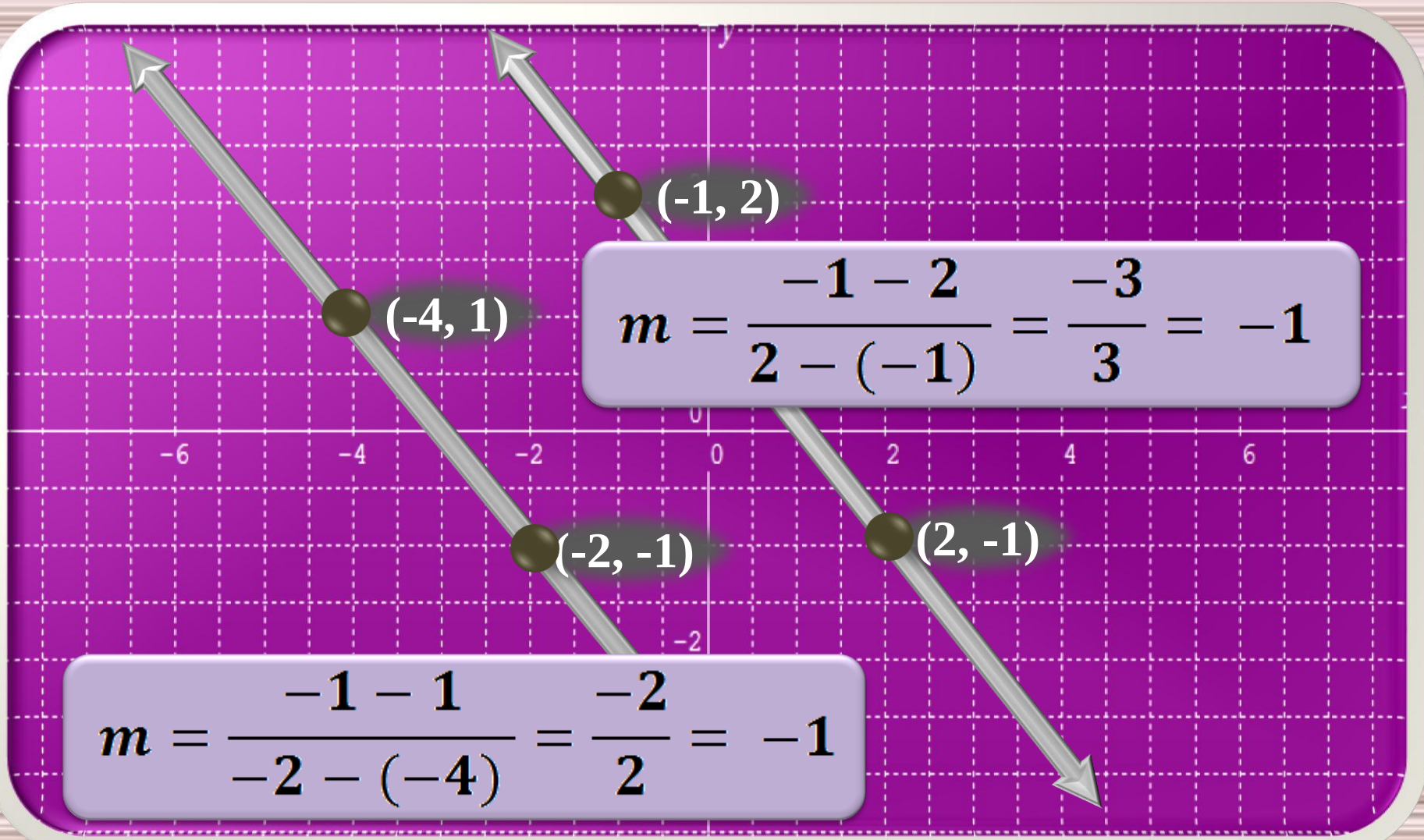
$$y = -\frac{2}{3}x - \frac{2}{3}$$

Parallel and Perpendicular Lines



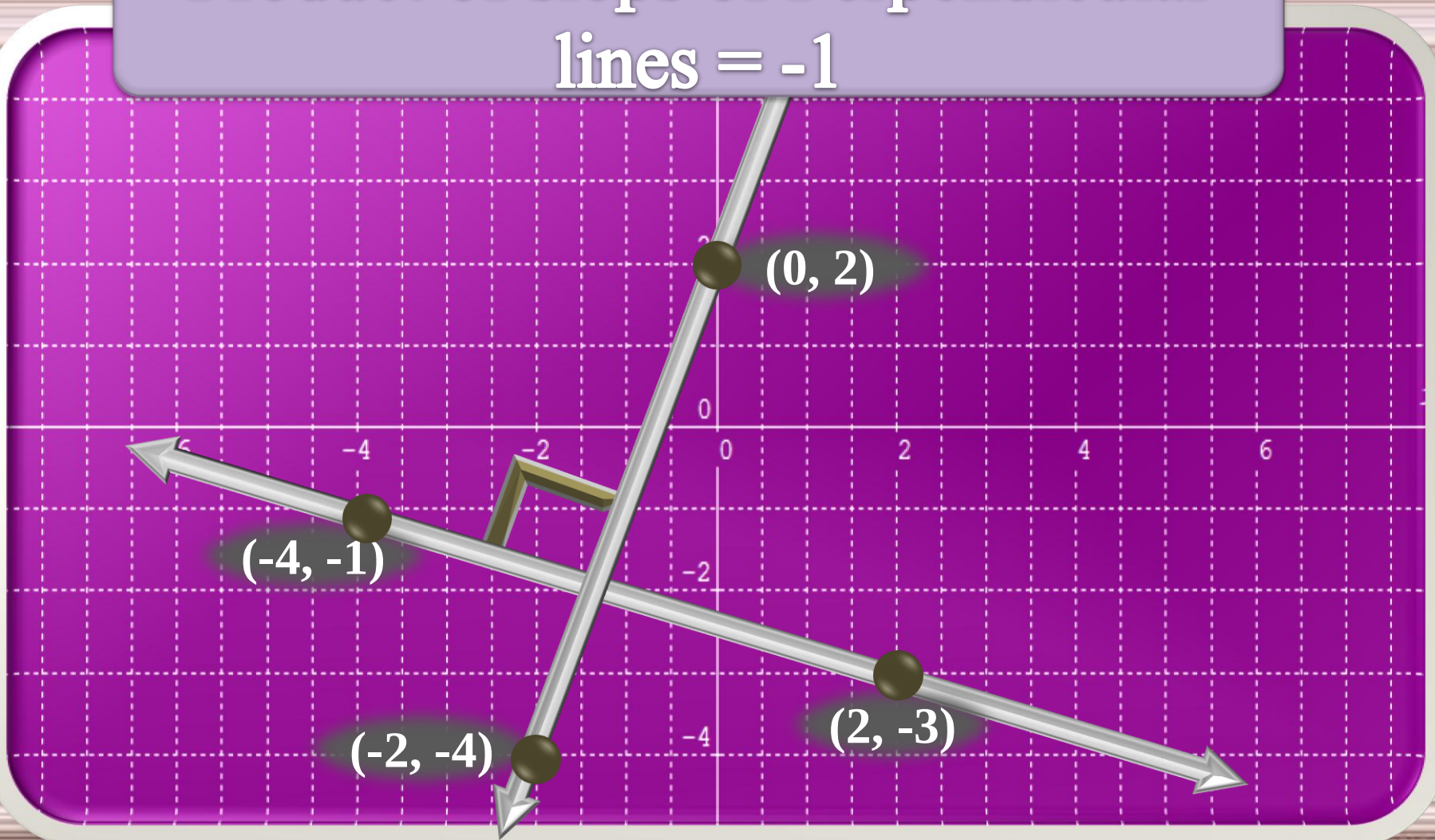
Parallel lines have same slope

Parallel and Perpendicular Lines

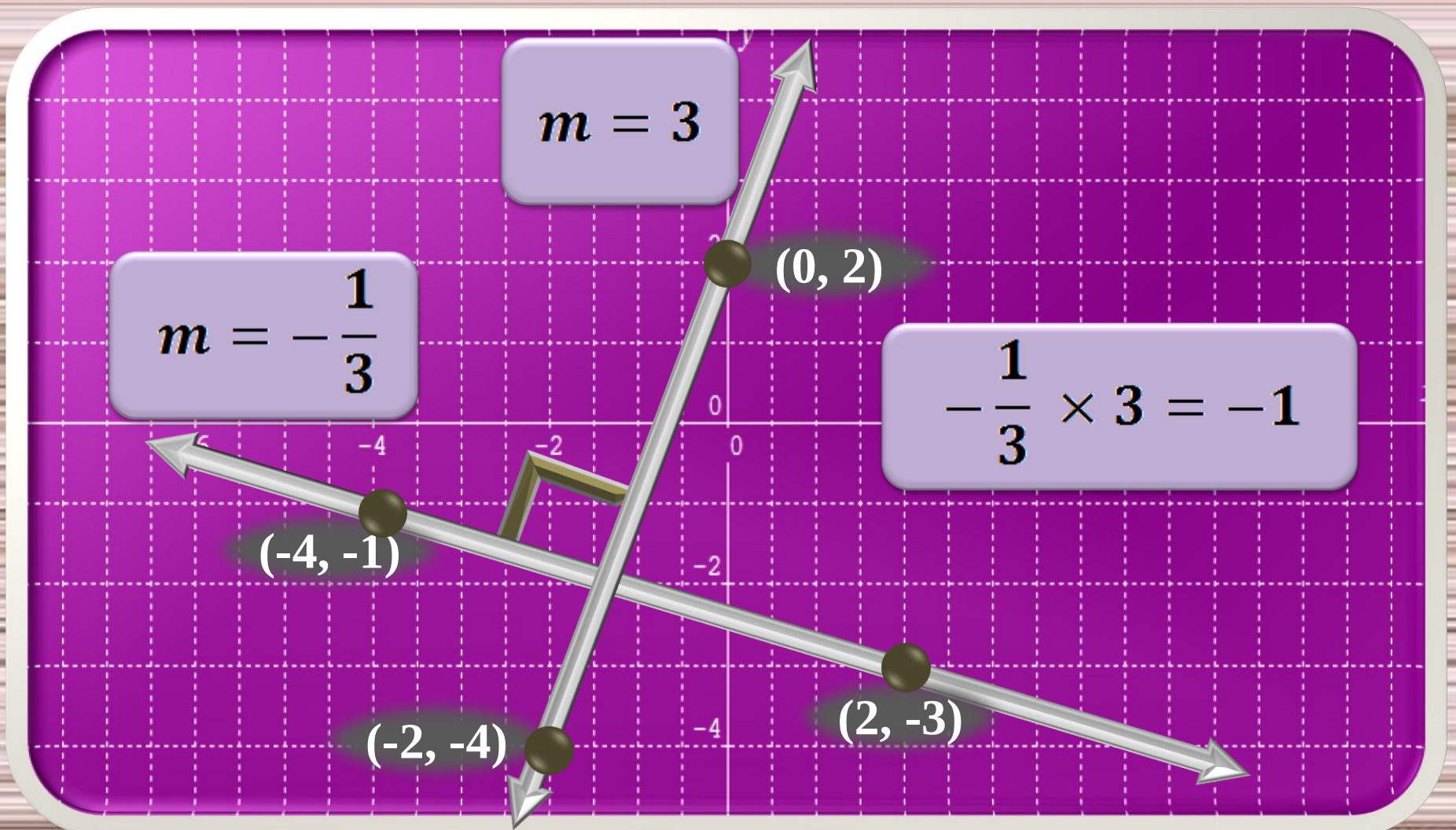


Parallel and Perpendicular Lines

Product of slops of Perpendicular lines = -1



Parallel and Perpendicular Lines



Slope – Intercept Form

$$y = mx + b$$

Point – Slope Form

$$y - y_1 = m(x - x_1)$$

Parallel Lines

$$L_1 \parallel L_2$$

$$m_1 = m_2$$

Perpendicular Lines

$$L_1 \perp L_2$$

$$m_1 = \frac{-1}{m_2}$$