SLOPE (m) $= \frac{\text{CHANGE IN } y}{\text{CHANGE IN } x}$

GIVEN 2 POINTS:
(x_1, y_1) (x_2, y_2)

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

1. $(-4, 2)$ $(5, 7)$
x_1 y_1 x_2 y_2

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{(7) - (2)}{(5) - (-4)}$$
$$= \frac{5}{5+4}$$
$$= \frac{5}{9}$$

NOTE: $\frac{0}{5} = 0$ → $y = \#$

NOTE: $\frac{7}{0}$ UNDEFINED → $x = \#$

SLOPE INTERCEPT FORM

$$y = mx + b$$

m: SLOPE, b: y-INTERCEPT

2. SLOPE $= -3$ $(-5, -1)$
x y

① FIND m
$m = -3$

② PLUG IN m AND GIVEN POINT (x, y) INTO $y = mx + b$ AND SOLVE FOR b

$y = mx + b$
$-1 = -3(-5) + b$
$-1 = 15 + b$
$-1 - 15 = b$
$-16 = b$

③ WRITE ANSWER
$y = mx + b$
$y = -3x - 16$

3. SLOPE $= -4$ $(-2, \frac{21}{2})$
x y

① $m = -4$

② $y = mx + b$
$\frac{21}{2} = -4(-2) + b$
$\frac{21}{2} = 8 + b$
$2\left(\frac{21}{2}\right) = 2(8) + 2(b)$
$21 = 16 + 2b$
$21 - 16 = 2b$
$5 = 2b$
$\frac{5}{2} = b$

③ $y = mx + b$
$y = -4x + \frac{5}{2}$

4. $(4, 10)$ $(8, 30)$
x_1 y_1 x_2 y_2

① $m = \frac{y_2 - y_1}{x_2 - x_1}$
$= \frac{(30) - (10)}{(8) - (4)}$
$= \frac{20}{4}$
$m = 5$

② $y = mx + b$
$10 = 5(4) + b$
$10 = 20 + b$
$10 - 20 = b$
$-10 = b$

③ $y = mx + b$
$y = 5x - 10$