For each type of question, the achievement level is indicated. Showing work is an important strategy in communicating your knowledge and ideas so please be thorough.

Learning Goal 6.3	Ability to move between all forms of the equation.

Proficient	
1. Rewrite the following equations in both slope-point form and general form.	
a. $y = 2x + 1$	b. $y = {}^2/_3\, x - 4$
c. $y = x + 3$	d. $y = {}^{-5x}/_4$
e. $y = {}^{-6x}/_5 - 1$	f. $y = -x + 2$

$$y = -\frac{5x}{4}$$

$x = 4 \qquad y = -5\left(\frac{4}{4}\right) \qquad (4, -5)$

$$y = -5$$

general form $Ax + By + C = 0$

$$4\left(y + 5\right) = \left[-\frac{5}{4}(x - 4)\right]4$$

$$4y + 20 = -5(x - 4)$$

$$4y + 20 = -5x + 20$$
$\qquad\quad -20 \qquad\qquad\qquad -20$

$$4y = -5x$$
$+5x \qquad +5x$

Slope - point· $y - y_1 = m(x - x_1)$

$$y - (-5) = -\frac{5}{4}(x - (4))$$

$$\boxed{y + 5 = -\frac{5}{4}(x - 4)}$$

$$\boxed{5x + 4y = 0}$$

Extending	
2. Rewrite the following equations in both slope-intercept form and general form.	
a. $y - 3 = 2(x + 1)$	b. $y + 1 = {}^2/_5\,(x - 4)$
c. $y = -{}^1/_2\,(x + 3)$	d. $y - 2 = {}^{-5}/_4\,(x - 1)$
e. $y + 5 = {}^{-4}/_3\,(x - 1)$	f. $y = 3(x + 2)$
3. Rewrite the following equations in both slope-intercept form and slope-point form.	
a. $x + 2y + 10 = 0$	b. $2x - 3y - 6 = 0$
c. $3x + 6y - 12 = 0$	d. $2x - y + 5 = 0$
e. $x + 8y - 2 = 0$	f. $5x + 7y + 11 = 0$

2d. $\overset{m}{4\left(y - 2\right)} = \left[-\frac{5}{4}(x - 1)\right]4$

$5x + 4y - 13 = 0$

y-int $(x = 0)$

$$4y - 8 = -5(x-1)$$

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$$5(0) + 4y - 13 = 0$$

$$4y - 8 = -5x + 5$$

$$+5x \quad -5 \qquad +5x \quad -5$$

$$4y - 13 = 0$$
$$+13 \quad +13$$

$$\boxed{5x + 4y - 13 = 0}$$

$$\frac{4y}{4} = \frac{13}{4}$$

General form

$$y = \frac{13}{4}$$

Slope-intercept $(y = mx + b)$

$$y = -\frac{5}{4}x + \frac{13}{4}$$

3e. $\quad x + 8y - 2 = 0$

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

Slope-intercept

y-int $(x = 0)$

$$(0) + 8y - 2 = 0$$
$$+2 \quad +2$$

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

$$\boxed{y = -\frac{1}{8}x + \frac{1}{4}}$$

$$\frac{8y}{8} = \frac{2}{8}$$

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

① $\left(0, \frac{1}{4}\right)$

$$y = \frac{1}{4}$$

$$= -\frac{1}{8}$$

Slope-point

$$y - (0) = -\frac{1}{8}(x - (2))$$

x-int $(y = 0)$

$$x + 8(0) - 2 = 0$$
$$+2 \quad +2$$

$$\boxed{y = -\frac{1}{8}(x - 2)}$$

② $(2, 0)$

$$x = 2$$

Extending
4. Write the equation in slope-intercept form of a line with

a. a slope of 3 through the point (2, 5)	b. a slope of $-1/3$ through the point (-9, 2)
c. a slope of $-5/3$ through the point (3, 0)	d. a slope of $3/2$ through the point (7, -1)
e. a slope of $3/4$ through the point (-10, 3)	f. a slope of -1 through the point (-1, -1)

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

$$y - (-1) = \frac{3}{2}(x - (7))$$

$$2(y + 2) = \left(\frac{3}{2}(x - 7)\right)2 \quad \longleftarrow \qquad \Longrightarrow \qquad y + 2 = \frac{3}{2}x - \frac{21}{2} - \frac{4}{2}$$
$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad -2$$

$$2y + 4 = 3(x - 7)$$

$$2y + 4 = 3x - 21$$
$$ -4 \qquad\quad -4$$

$$\frac{2y}{2} = \frac{3x - 25}{2}$$

$$y = \frac{3}{2}x - \frac{25}{2}$$

$$y = \frac{3}{2}x - \frac{25}{2}$$