1e) $y - y_1 = m(x - x_1)$

→ $y = mx + b$

$y - 3 = -\frac{1}{2}(x + 8)$

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

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

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

$\frac{1}{2} \cdot \frac{x}{1}$

$= \frac{1 \cdot x}{2 \cdot 1}$

→ $Ax + By + C = 0$

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

$0 = x + 2y + 2$

A = whole # i.e.: positive integer

$x + 2y + 2 = 0$

1a) $y + 3 = x - 5$

$y = mx + b$

$x + 3 = x - 5$

$y = x - 5 - 3$

$y = x - 8$

$Ax + By + C = 0$

$y + 3 = x - 5$

$-x + y + 3 + 5 = 0$

$-x + y + 8 = 0$

$x - y - 8 = 0$

3b) $(-3, -5)$ $m = -2$

Point slope

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

$y - (-5) = -2(x - (-3))$

$y + 5 = -2(x + 3)$

slope intercept

$y = mx + b$

$y + 5 = -2(x + 3)$

$y + 5 = -2x - 6$

$y = -2x - 6 - 5$

$y = -2x - 11$

General form

$Ax + By + C = 0$

$2x + y + 11 = 0$

$0 = -2x - y - 11$

$0 = 2x + y + 11$

2b) Graph $\rightarrow$ point / slope

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

$P_1(1, -3)$ $m = \frac{-3}{2}$

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

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

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

$P_1(-1, 0)$ $P_2(1, -3)$

$m = \frac{-3 - 0}{1 - (-1)}$

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

3c) $(-8, 3)$ $m = \frac{1}{2}$

| | intercept | General form

slope/point

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

$y - 3 = \frac{1}{2}(x - (-8))$

$y - 3 = \frac{1}{2}(x + 8)$

slope intercept

$y = mx + b$

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

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

$y = \frac{x}{2} + 7$

general

$Ax + By + C = 0$

$-\frac{x}{2} + y + 7 = 0$

$x - 2y - 14 = 0$

12b) point slope → general

$m = -4 \quad P_1(2, -1)$

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

$y - (-1) = -4(x - 2)$

$y + 1 = -4(x - 2)$

$Ax + By + C = 0$

$y + 1 = -4x + 8$

$4x + y + 1 - 8 = 0$

$4x + y - 7 = 0$ ✓

11b) slope/point → slope intercept

$y - y_1 = m(x - x_1) \rightarrow y = mx + b$

$3x + y = 5 \quad P_1(-2, 4)$

$y = -3x + 5$

$m = -3$

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

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

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

$y - 4 = -3x - 6$

$y = -3x - 6 + 4$

$y = -3x - 2$

c) $x - 2y + 6 = 0$

slope

$3x - 2y = 24$

x-int ← when $y = 0$

$-2y = -x - 6$

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

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

$3x - 2(0) = 24$

$3x = 24$

$x = \frac{24}{3}$

$x = 8$ Point @ $(8, 0)$

Point Slope

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

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

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

slope intercept

$y = mx + b$

$y = \frac{x}{2} - 4$

14b) rate of change does the slope represent

↳ units!!

$\frac{\text{Velocity}}{\text{Temperature}}$ → How velocity changes with respect to Temperature.

ie: as temperature increases so does velocity.

c) $y = mx + b$ $P_1(6, 335)$ $P_2(16, 341)$

$m = \frac{341 - 335}{16 - 6}$

$= \frac{6}{10}$

$= \frac{3}{5}$

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

$y - 335 = \frac{3}{5}(x - 6)$

$y = mx + b$

$y = \frac{3}{5}x + 331$

d) $f(35) = \frac{3}{5}(35) + 331$

$= 352 \text{ m/s}$

e) $348 = \frac{3x}{5} + 331$

$348 - 331 = \frac{3x}{5}$

$17 = \frac{3x}{5}$

$\frac{5}{3}(17) = x$

$28.3^\circ C = x$

12 c) $3x + y = 12$

x-int when $y = 0$

$3x = 12$

$x = 4$

$P_1(4, 0)$ $P_2(0, 2)$

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

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

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

18)

Protein $= \frac{3}{5}p + 30$

b) $m = \frac{3}{5}$

c) Protein intercept = 30

→ because you have 30g even with zero potatoes

d) $\{p \mid p \geq 0, p \in \mathbb{R}\}$

$\{\text{protein} \mid \text{protein} \geq 30, \text{protein} \in \mathbb{R}\}$