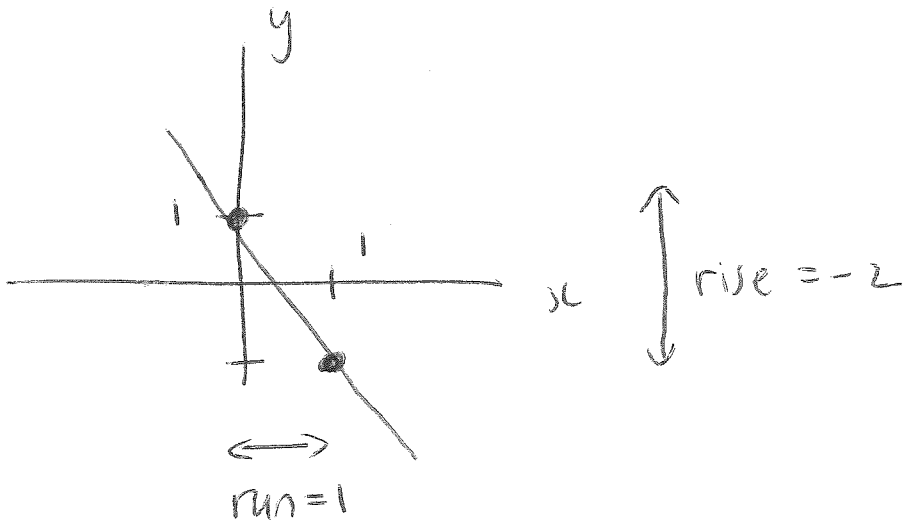
Section 1.4

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

y-intercept = 1 or (0, 1)

slope $= -2$

$= \frac{-2}{1}$ ← rise
← run



(15) From the graph, $m = \frac{-2}{1} = -2$

and a point is $(2, 3)$.

$y = mx + b$

$\boxed{y = -2x + b}$

Sub $x = 2, y = 3$: $3 = -4 + b$

$7 = b$

$\boxed{y = -2x + 7}$

(17) From the graph, two points are (1,2) and (2,0).

(x_1, y_1) → (1,2) and (2,0) ← (x_2, y_2)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0-2}{2-1} = \frac{-2}{1} = -2$$

$$y = mx + b$$

$$\boxed{y = -2x + b}$$

Sub either point

Sub $x=1, y=2$: $2 = -2 + b$

$4 = b$

$$\boxed{y = -2x + 4}$$

(19) Given line: $y = -4x + 10$

Desired line is perpendicular to the given line, and passes through $(2, 2)$.

Slope of given line $m = -4$

Slope of desired line $m = \frac{-1}{-4} = \frac{1}{4}$

Desired line: $y = mx + b$

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

Sub $x = 2, y = 2$: $2 = \frac{2}{4} + b$

$2 = \frac{1}{2} + b$

Multiply by 2: $4 = 1 + 2b$

$3 = 2b$

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

$$\boxed{y = \frac{1}{4}x + \frac{3}{2}}$$

(21) Given line : $y = -x + 2$

Desired line is parallel to the given line, and passes through $(0, 0)$.

Slope of given line : $m = -1$

Slope of desired line : $m = -1$

Desired line : $y = mx + b$

$\boxed{y = -x + b}$

Sub $x = 0, y = 0$: $0 = 0 + b$

$b = 0$

$\boxed{y = -x}$

(31) a) Let x = # of radios made

y = Cost in \$

Two points on the line are (20, 6800) and (50, 9500).

(x_1, y_1) = (20, 6800) ↗ (x_2, y_2) = (50, 9500) ↖

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

$$= \frac{9500 - 6800}{50 - 20}$$

$$= \frac{2700}{30}$$

$$= 90$$

$y = mx + b$

$\boxed{y = 90x + b}$

Sub either point

Sub $x = 20, y = 6800$: $6800 = 1800 + b$

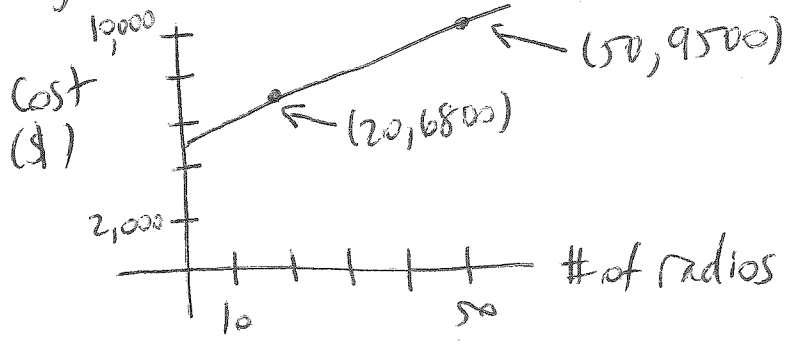
$5000 = b$

$\boxed{y = 90x + 5000}$

b) The fixed cost is \$5000

c) The marginal cost is \$90/radio

d)



(41) $y = mx + b$

$m = -\frac{1}{3}$: $\boxed{y = -\frac{1}{3}x + b}$

Sub $x = 6, y = -2$: $-2 = -\frac{1}{3}(6) + b$

$-2 = -2 + b$

$0 = b$

$\boxed{y = -\frac{1}{3}x}$

(47) Two points on the line are:

$(5, -3)$ and $(-1, 3)$.

(x_1, y_1) (x_2, y_2)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - (-3)}{-1 - 5} = \frac{6}{-6} = -1$$

$$y = mx + b$$

$$\boxed{y = -x + b}$$

Sub either point:

Sub $x = 5, y = -3$: $-3 = -5 + b$

$2 = b$

$$\boxed{y = -x + 2}$$