

(1) [3 points] Determine the equation of the line with slope 5 containing the point  $(-4, 1)$ .

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

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

$$\boxed{y - 1 = 5(x + 4)}$$

or

$$y - 1 = 5x + 20$$

$$\boxed{y = 5x + 21}$$

(2) [3 points] Determine the equation of the line passing through the points  $(-1, 3)$  and  $(1, 1)$ .

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 1}{-1 - 1} = \frac{2}{-2} = -1$$

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

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

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

or

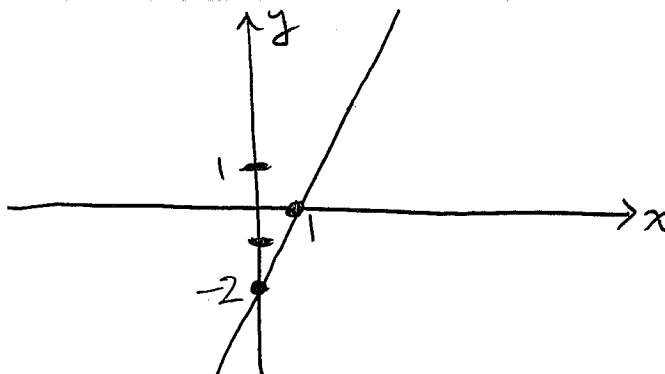
$$y - 1 = -x + 1$$

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

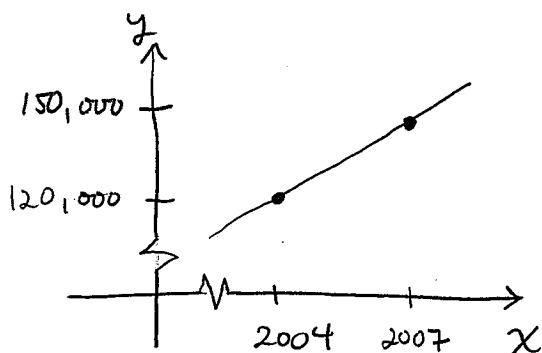
(3) [4 points] Determine the slope and  $y$ -intercept of the line  $\frac{1}{2}y = x - 1$ . Graph the line.

$$\begin{aligned}\frac{1}{2}y &= x - 1 \\ y &= 2(x - 1) \\ y &= 2x - 2\end{aligned}$$

$\therefore m = 2, y\text{-intercept is } (0, -2)$



(4) [5 points] The average cost of a home in 2004 was \$120,000 while in 2007 it was \$150,000. Determine an equation relating  $y$ , the average cost of a home, to the year  $x$ .



$$\begin{aligned}m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{150,000 - 120,000}{2007 - 2004} \\ &= \frac{30,000}{3} \\ &= 10,000\end{aligned}$$

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

$$y - 120,000 = 10,000(x - 2004)$$

or  $y = 10,000x - 20,040,000 + 120,000$

$$y = 10,000x - 19,920,000$$