

Name: \_\_\_\_\_

Work on as many problems as you can together with your group members. Towards the end of lecture your group will be asked to present problems correctly to receive classwork points.

1. Find the slope of the line passing through the two given points. Then write an equation for this line:

- (a)  $(-2, 5), (3, 4)$
- (b)  $(3, -6), (6, 18)$
- (c)  $(-2, 2), (5, -5)$
- (d)  $(7, 1), (-3, -4)$
- (e)  $(0, 3), (4, 5)$

**Solution**

- (a)

$$\begin{aligned}\frac{4 - 5}{3 - (-2)} &= \frac{-1}{3 + 2} \\ &= \boxed{-\frac{1}{5}}\end{aligned}$$

- (b)

$$\begin{aligned}\frac{18 - (-6)}{6 - 3} &= \frac{18 + 6}{3} \\ &= \frac{24}{3} \\ &= \boxed{8}\end{aligned}$$

- (c)

$$\begin{aligned}\frac{-5 - 2}{5 - (-2)} &= \frac{-7}{5 + 2} \\ &= \frac{-7}{7} \\ &= \boxed{-1}\end{aligned}$$

- (d)

$$\begin{aligned}\frac{-4 - 1}{-3 - 7} &= \frac{-5}{-10} \\ &= \boxed{\frac{1}{2}}\end{aligned}$$

(e)

$$\frac{5-3}{4-0} = \frac{2}{4}$$
$$= \boxed{\frac{1}{2}}$$

□

2. Find the equation of the line with given slope  $m$  and passing through the point  $P$ . Write the equation in slope-intercept form:

(a)  $m = 3, P = (-2, 5)$

(b)  $m = -2, P = (1, 4)$

(c)  $m = -\frac{1}{2}, P = (0, 4)$

(d)  $m = \frac{3}{4}, P = (5, 1)$

(e)  $m = -3, P = (-2, -6)$

**Solution**

(a)

$$\begin{aligned}y - 5 &= 3(x - (-2)) \Leftrightarrow y - 5 = 3(x + 3) \\ &\Leftrightarrow y - 5 = 3x + 9 \\ &\Leftrightarrow \boxed{y = 3x + 14}\end{aligned}$$

(b)

$$\begin{aligned}y - 4 &= -2(x - 1) \Leftrightarrow y - 4 = -2x + 2 \\ &\Leftrightarrow \boxed{y = -2x + 8}\end{aligned}$$

(c)

$$\begin{aligned}y - 4 &= -\frac{1}{2}(x - 0) \Leftrightarrow y - 4 = -\frac{1}{2}x \\ &\Leftrightarrow \boxed{y = -\frac{1}{2}x + 4}\end{aligned}$$

(d)

$$\begin{aligned}y - 1 &= \frac{3}{4}(x - 5) \Leftrightarrow y - 1 = \frac{3}{4}x - \frac{15}{4} \\ &\Leftrightarrow y = \frac{3}{4}x - \frac{15}{4} + 1 \\ &\Leftrightarrow y = \frac{3}{4}x - \frac{15}{4} + \frac{4}{4} \\ &\Leftrightarrow \boxed{y = \frac{3}{4}x - \frac{11}{4}}\end{aligned}$$

(e)

$$\begin{aligned}y - (-6) &= -3(x - (-2)) \Leftrightarrow y + 6 = -3(x + 2) \\ &\Leftrightarrow y + 6 = -3x - 6 \\ &\Leftrightarrow \boxed{y = -3x - 12}\end{aligned}$$

□

3. Find the  $x$ -intercept, then graph the following linear functions:

(a)  $y = -3x + 6$

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

(c)  $y = 2x + 6$

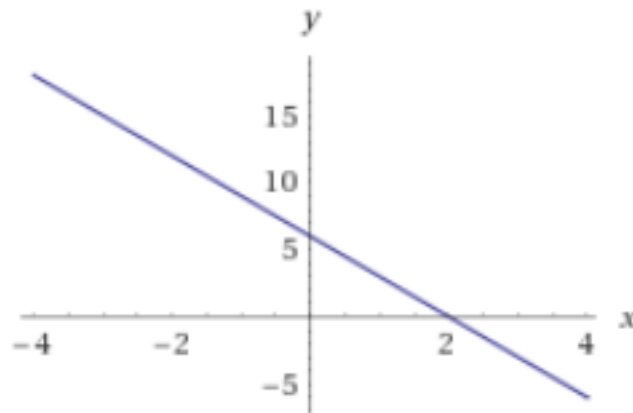
(d)  $y = -\frac{3}{4}x - 6$

(e)  $y = 5x + 5$

**Solution**

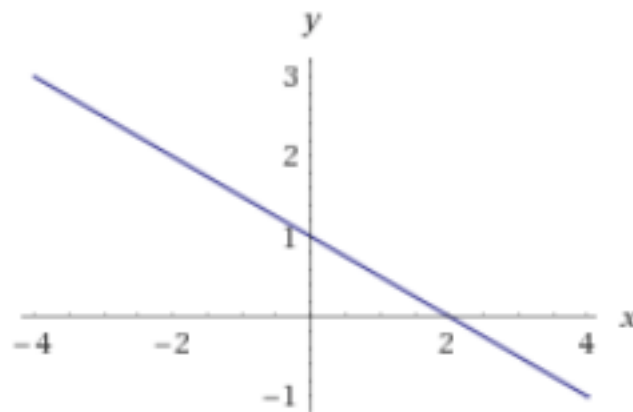
(a)

$$0 = -3x + 6 \Leftrightarrow 3x = 6 \Leftrightarrow \boxed{x = 2}$$



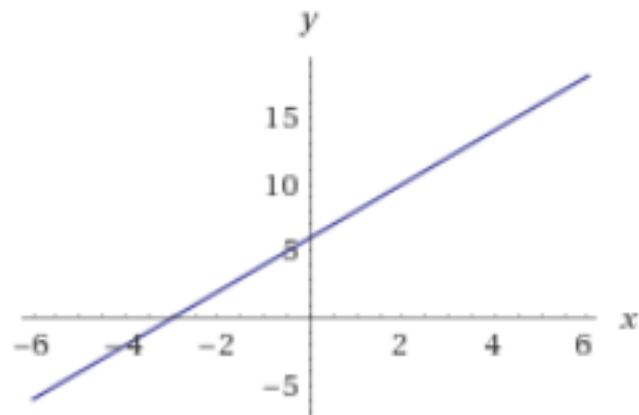
(b)

$$0 = -\frac{1}{2}x + 1 \Leftrightarrow \frac{1}{2}x = 1 \Leftrightarrow \boxed{x = 2}$$



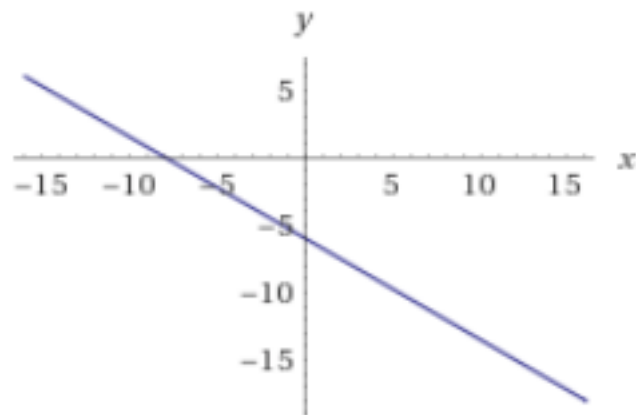
(c)

$$0 = 2x + 6 \Leftrightarrow -2x = 6 \Leftrightarrow \boxed{x = -3}$$



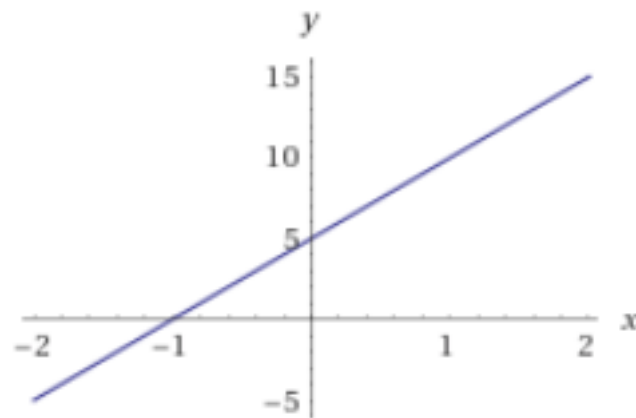
(d)

$$0 = -\frac{3}{4}x - 6 \Leftrightarrow \frac{3}{4}x = -6 \Leftrightarrow \boxed{x = -8}$$



(e)

$$0 = 5x + 5 \Leftrightarrow -5x = 5 \Leftrightarrow \boxed{x = -1}$$



□

4. Find the  $x$  and  $y$ -intercepts of the line whose equation is given in general form. Then graph the equation:

(a)  $2x + 4y + 8 = 0$

(b)  $-2x + 4y + 8 = 0$

(c)  $-2x - 4y + 8 = 0$

(d)  $2x - 4y + 8 = 0$

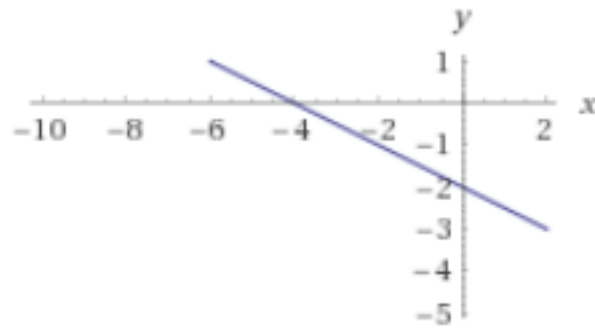
(e)  $2x - 4y - 8 = 0$

**Solution**

(a)

$$2x + 8 = 0 \Leftrightarrow 2x = -8 \Leftrightarrow \boxed{x = -4}$$

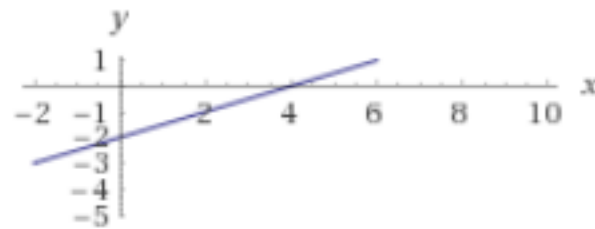
$$4y + 8 = 0 \Leftrightarrow 4y = -8 \Leftrightarrow \boxed{y = -2}$$



(b)

$$-2x + 8 = 0 \Leftrightarrow 2x = 8 \Leftrightarrow \boxed{x = 4}$$

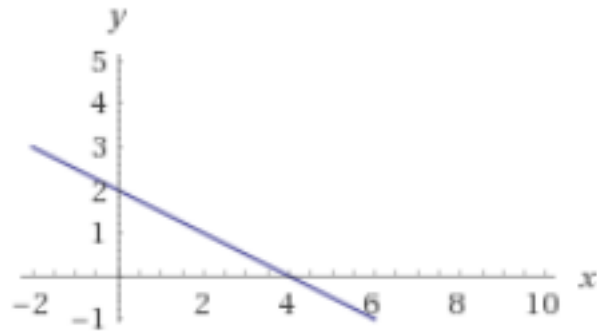
$$4y + 8 = 0 \Leftrightarrow 4y = -8 \Leftrightarrow \boxed{y = -2}$$



(c)

$$-2x + 8 = 0 \Leftrightarrow 2x = 8 \Leftrightarrow \boxed{x = 4}$$

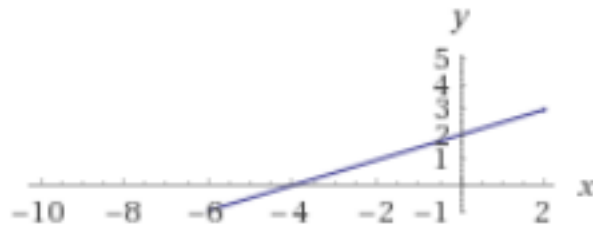
$$-4y + 8 = 0 \Leftrightarrow 4y = 8 \Leftrightarrow \boxed{y = 2}$$



(d)

$$2x + 8 = 0 \Leftrightarrow 2x = -8 \Leftrightarrow \boxed{x = -4}$$

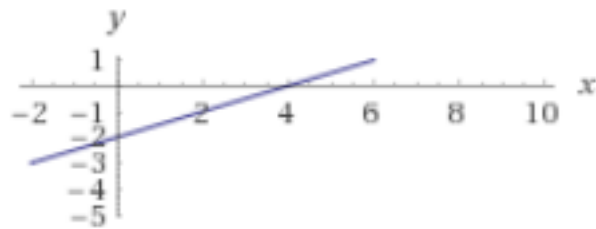
$$-4y + 8 = 0 \Leftrightarrow 4y = 8 \Leftrightarrow \boxed{y = 2}$$



(e)

$$2x - 8 = 0 \Leftrightarrow 2x = 8 \Leftrightarrow \boxed{x = 4}$$

$$-4y - 8 = 0 \Leftrightarrow -4y = 8 \Leftrightarrow \boxed{y = -2}$$



□

5. Write the equation of the line with the given intercepts:

(a)  $x$  - intercept = 5,  $y$  - intercept = 4

(b)  $x$  - intercept = -2,  $y$  - intercept = -1

(c)  $x$  - intercept = 3,  $y$  - intercept = -3

(d)  $x$  - intercept = -1,  $y$  - intercept = 6

(e)  $x$  - intercept = 2,  $y$  - intercept = 8

**Solution**

(a)

Points: (5, 0), (0, 4)

$$m = -\frac{4}{5} \text{ and } b = 4 \Leftrightarrow y = \boxed{-\frac{4}{5}x + 4}$$

(b)

Points: (-2, 0), (0, -1)

$$m = -\frac{1}{2} \text{ and } b = -1 \Leftrightarrow y = \boxed{-\frac{1}{2}x - 1}$$

(c)

Points: (3, 0), (0, -3)

$$m = 1 \text{ and } b = -3 \Leftrightarrow \boxed{y = x - 3}$$

(d)

Points: (-1, 0), (0, 6)

$$m = 6 \text{ and } b = 6 \Leftrightarrow \boxed{y = 6x + 6}$$

(e)

Points: (2, 0), (0, 8)

$$m = -4 \text{ and } b = 8 \Leftrightarrow \boxed{y = -4x + 8}$$

□