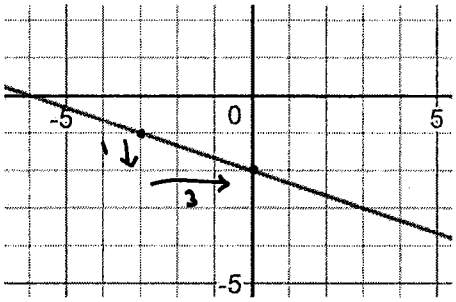
KEY

Unit 5 & 6 – Final Review

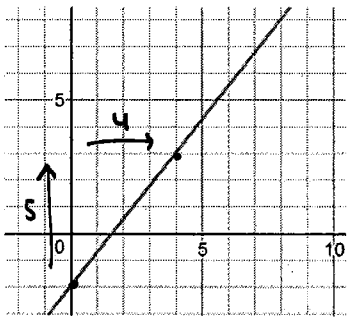
1. Write the equation in slope-intercept form

a)



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

b)



$y = \frac{5}{4}x - 2$

2. Use the formula to find the slope of the line segment:

a) $A\ (-4, 3)$ and $B\ (2, -5)$

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

$m = \frac{-5 - 3}{2 - (-4)}$

$m = -\frac{8}{6}$

$\boxed{m = -\frac{4}{3}}$

b) $C\ (2, -7)$ and $D\ (-1, 5)$

$m = \frac{5 - (-7)}{-1 - 2}$

$m = \frac{12}{-3}$

$\boxed{m = -4}$

3. Write an equation for a line that passes through the point A (5, -2) and is perpendicular to the line $y = 3x + 5$.

a) point slope form

$m_\perp = -\frac{1}{3}$

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

$y - (-2) = -\frac{1}{3}(x - 5)$

$\boxed{y + 2 = -\frac{1}{3}(x - 5)}$

b) slope-intercept form

$y + 2 = -\frac{1}{3}(x - 5)$

$y + 2 = -\frac{1}{3}x + \frac{5}{3}$

$y = -\frac{1}{3}x + \frac{5}{3} - \frac{2 \times 3}{1 \times 3}$

$y = -\frac{1}{3}x + \frac{5}{3} - \frac{6}{3}$

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

4. Write each equation in general form.

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

$y - 2 = -3x - 15$

$\boxed{y + 13 + 3x = 0}$

b) $y + 9 = \frac{1}{3}(x - 4)$

$\left(y + 9 = \frac{1}{3}x - \frac{4}{3}\right)^{\times 3}$

$3y + 27 = x - 4$

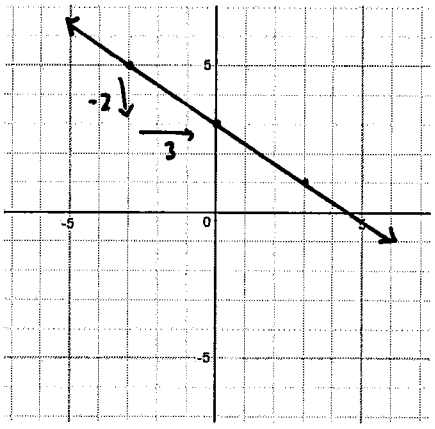
$-3y \quad -27 \quad -3y \quad -27$

$\boxed{0 = x - 3y - 31}$

5. Graph each linear function.

a) $y - 5 = -\frac{2}{3}(x + 3)$

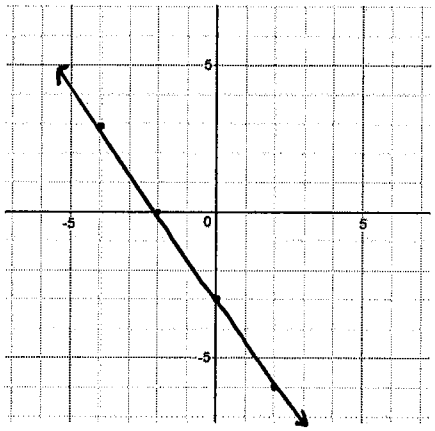
$m = -\frac{2}{3}$ point $(-3, 5)$



b) $-2y - 6 = 3x$

$+6 \quad +6$

$\frac{-2y}{-2} = \frac{3x}{-2} + \frac{6}{-2}$ $\quad y = -\frac{3}{2}x - 3$



6. Determine the coordinates of the x and y intercepts of the line. Use the points to graph the linear function. $4x - 8y + 24 = 0$

$(0, y)$

$4(0) - 8y + 24 = 0$

$-8y = -24$

$y = 3$

$(0, 3)$

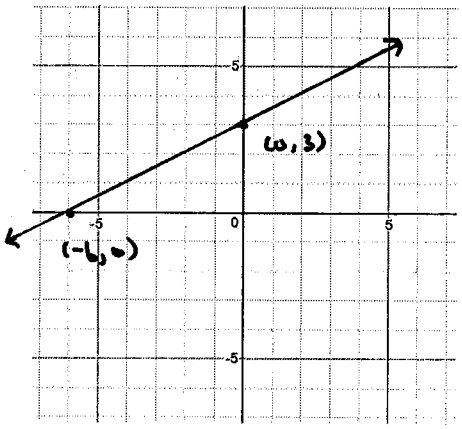
$(x, 0)$

$4x - 8(0) + 24 = 0$

$4x = -24$

$x = -6$

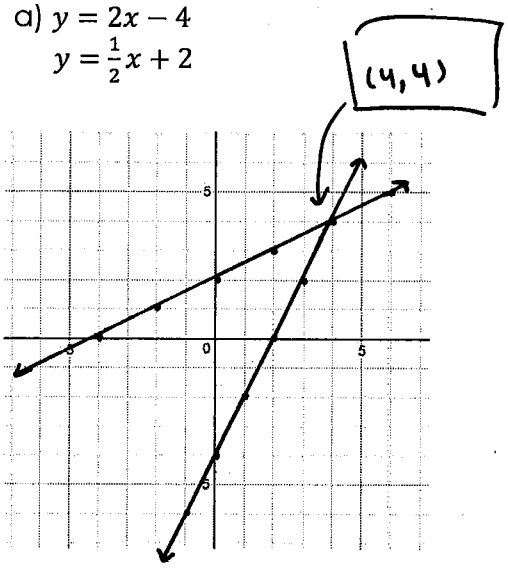
$(-6, 0)$



7. Solve by graphing:

a) $y = 2x - 4$

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

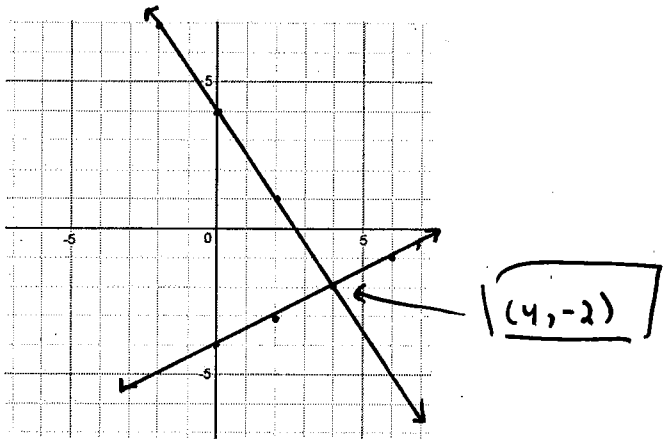


b) $2y = 8 - 3x$

$-8 - 2y + x = 0$

$\frac{2y}{2} = \frac{8}{2} - \frac{3x}{2}$ $\quad y = -\frac{3}{2}x + 4$

$-\frac{8}{2} + \frac{x}{2} = \frac{2y}{2}$ $\quad -4 + \frac{1}{2}x = y$



8. Solve by substitution.

a) $y = -x + 2$
$0 = 3x - y - 2$

$0 = 3x - (-x+2) - 2$
$0 = 3x + x - 2 - 2$
$0 = 4x - 4$
$4 = 4x$
$x = 1$

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

$(1, 1)$

b) $4y = 7x - 16$
$8 = -x + 4y$

$x = 4y - 8$

$4y = 7(4y - 8) - 16$
$4y = 28y - 56 - 16$
$4y = 28y - 72$
$-24y = -72$
$y = 3$

$x = 4y - 8$
$x = 4(3) - 8$
$x = 4$

$(4, 3)$

9. Solve by elimination.

a) $2y = 10x - 6$
$0 = 3 - x - y$

$2x\ (y = 3 - x)$
$2y = 6 - 2x$
$-(2y = 10x - 6)$
$0 = -12x + 12$
$12x = 12$
$x = 1$

$y = 3 - x$
$y = 3 - (1)$
$y = 2$

$(1, 2)$

b) $\left(-\frac{3}{2}x - 3y - 9 = 0\right)^{\times 2} \rightarrow -3x - 6y - 18 = 0$
$(-7x - 2y + 6 = 0)^{\times 3} \rightarrow -(-21x - 6y + 18 = 0)$
$18x - 36 = 0$
$18x = 36$
$x = 2$

$-7(2) - 2y + 6 = 0$
$-14 + 6 = 2y$
$-8 = 2y$
$y = -4$

$(2, -4)$

10. Solve by the method of your choice.

a) $\left(y + \frac{7}{2}x = 3\right)^{2}$ $2y + 7x = 6$
$2y + x + 6 = 0$

$2y + 7x - 6 = 0$
$-(2y + x + 6 = 0)$
$6x - 12 = 0$
$6x = 12$
$x = 2$

$(2, -4)$

$2y + 7(2) = 6$
$2y + 14 = 6$
$2y = -8$
$y = -4$

b) $\left(1 = \frac{1}{2}y - \frac{1}{6}x\right)^{6}$ $6 = 3y - x$
$-5x - 12 - 3y = 0$

$6 = 3y - x$
$x = 3y - 6$

$-5(3y - 6) - 12 - 3y = 0$
$-15y + 30 - 12 - 3y = 0$
$-18y + 18 = 0$
$-18y = -18$
$y = 1$

$x = 3(1) - 6$
$x = -3$

$(-3, 1)$

11. Verify that $(-2,-5)$ is a solution to the linear system of equations: $3x-\frac{1}{2}y=-1$
$3+y-x=0$

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

$3(-2)-\frac{1}{2}(-5)=-1$

$-6+\frac{5}{2}=-1$

$-\frac{7}{2}\neq -1$

$3+y-x=0$

$3+(-5)-(-2)=0$

$3-5+2=0$

$0=0$ ✓

$(-2,-5)$ is NOT a solution

12. Determine the number of solutions for each linear system.

a) $4y+6x+4=0$ ①
$2y=-3x+2$ ②

① $4y+6x+4=0$

$4y=-6x-4$

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

② $2y=-3x+2$

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

same slope $(-\frac{3}{2})$

but different y-intercepts

→ parallel lines

no solutions

b) $-y-x=-8$ ①
$\frac{1}{4}y=2-\frac{1}{4}x$ ②

① $-y-x=-8$

$y=-x+8$

② $(\frac{1}{4}y=2-\frac{1}{4}x)4$

$y=8-x$

same slope

infinite number of solutions

Additional Practice: p.326 #3 – 6, 8, 9, 11,13, 16 – 18 et p.452 #4, 7, 10ab, 12, 15, 20