Module 6 Review Solutions

1. $(100, 1000) \rightarrow y = 8x + 200 \rightarrow 1000 = 8(100) + 200 \rightarrow 1000 \overset{\checkmark}{=} 1000$

$(100, 1000) \rightarrow y = 10x \rightarrow 1000 = 10(100) \rightarrow 1000 \overset{\checkmark}{=} 1000$

$(100, 1000)$ is a solution to the system since it makes both equations true.

When 100 hours are worked in either job, \$1000 is earned.

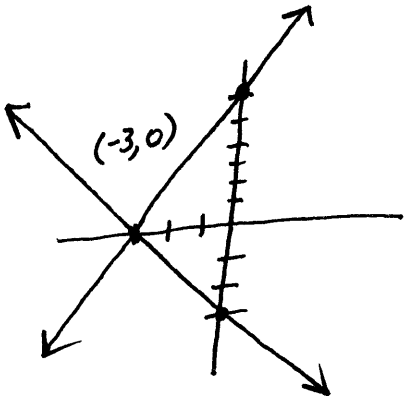
2. Intersections are solutions so solution is $(-3, 6)$

3. $y = 2x + 6$
$(y = -x - 3)(-1)$ $\rightarrow$

$$\begin{array}{r} y = 2x + 6 \\ -y = x + 3 \\ \hline 0 = 3x + 9 \end{array}$$

$3x + 9 = 0$
$3x = -9$
$\boxed{x = -3}$

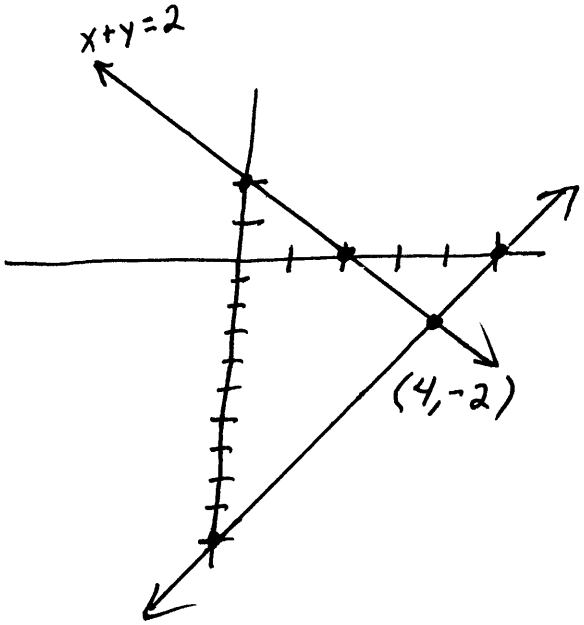
$y = 2x + 6$
$y = 2(-3) + 6$
$y = -6 + 6$
$\boxed{y = 0}$



$y = 2x + 6$
$y = -x - 3$

b. $x + y = 2$
$2x - y = 10$
$3x = 12$
$\boxed{x = 4}$

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



4. x = # adult tickets
y = # student tickets

$x + y = 1330$
$8x + 5y = 8300$

Eliminate $y \rightarrow (x + y = 1330)(-5) \rightarrow -5x - 5y = -6650$
$8x + 5y = 8300$

$3x = 1650$

$\boxed{x = 550}$

$x + y = 1330$
$550 + y = 1330$
$\boxed{y = 780}$

780 student tickets were sold.

5. a.) $4x - 7y = 10$ (2)
$3x + 2y = -7$ (7)

Eliminate $y \rightarrow$ $8x - 14y = 20$
$21x + 14y = -49$

$29x = -29$

$\boxed{x = -1}$

$3x + 2y = -7$
$3(-1) + 2y = -7$
$-3 + 2y = -7$
$2y = -4$
$\boxed{y = -2}$

$(-1, -2)$

b.) $3x - 5y = 3$
$4x + 5y = 4$

Eliminate $y \rightarrow$ $7x = 7$

$\boxed{x = 1}$

$3x - 5y = 3$
$3(1) - 5y = 3$
$3 - 5y = 3$
$-5y = 0$
$\boxed{y = 0}$

$(1, 0)$

c.) $9x - 4y = -12$
$y = \boxed{\frac{1}{4}x - 3}$ $\rightarrow$

Substitute for y
$9x - 4(\frac{1}{4}x - 3) = -12$
$9x - x + 12 = -12$
$8x + 12 = -12$
$8x = -24$
$\boxed{x = -3}$

$y = \frac{1}{4}x - 3$
$y = \frac{1}{4}(-3) - 3$
$y = \frac{-3}{4} - 3$
$y = \frac{-3}{4} - \frac{12}{4}$
$\boxed{y = \frac{-15}{4}}$

$(-3, \frac{-15}{4})$

6. $2x - y \geq 5$

$2x - y = 5$ has

$x$int $\rightarrow 2x = 5$ $\quad$ $y$int $\rightarrow -y = 5$

$\boxed{x = 2.5}$ $\quad$ $\boxed{y = -5}$

Test Point (0,0)

$2x - y \geq 5 \rightarrow 2(0) - 0 \geq 5$

$0 \geq 5$

False

(Shade opposite side from (0,0))

$8x + 8y > 32$

$8x + 8y = 32$ has

$x$int $\rightarrow 8x = 32$ $\quad$ $y$int $\rightarrow 8y = 32$

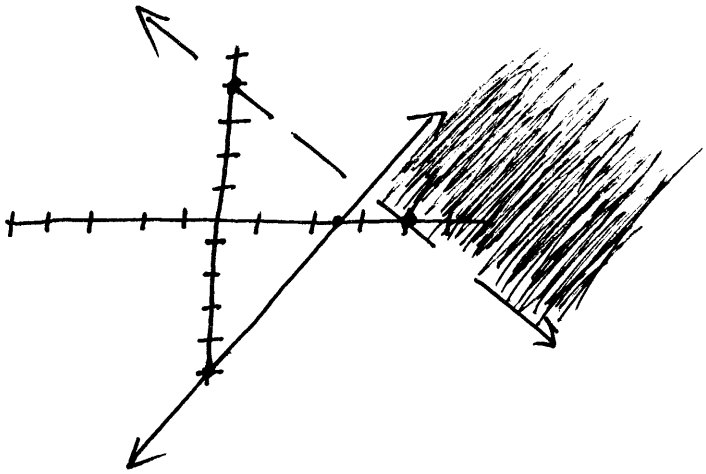
$\boxed{x = 4}$ $\quad$ $\boxed{y = 4}$

Test Point (0,0)

$8x + 8y > 32 \rightarrow 8(0) + 8(0) > 32$

$0 > 32$

False



7. x = # CDs

y = # DVDs

7a.) $x + y > 7$

$9x + 12y \leq 100$

7b.) Since (5,4) would give $5 + 4 > 7$, it is a solution because inequality is true at this point.