Left Side Right Side
$3x - 2y$ 12
$= 3(6) - 2(3)$
$= 12$
Left Side $\ngtr$ Right Side

Left Side Right Side
$3x - 2y$ 12
$= 3(12) - 2(-4)$
$= 44$
Left Side > Right Side

Try (–6, –3).
Left Side Right Side
$3x - 2y$ 12
$= 3(-6) - 2(-3)$
$= -12$
Left Side $\ngtr$ Right Side

Try (5, 1).
Left Side Right Side
$3x - 2y$ 12
$= 3(5) - 2(1)$
$= 13$
Left Side > Right Side

The ordered pairs (12, –4) and (5, 1) are solutions to the inequality $3x - 2y > 12$.

d) $2x + y \geq 6$

Try (0, 0).
Left Side Right Side
$2x + y$ 6
$= 2(0) + 0$
$= 0$
Left Side $\ngeq$ Right Side

Try (3, 1).
Left Side Right Side
$2x + y$ 6
$= 2(3) + 1$
$= 7$
Left Side ≥ Right Side

Try (–4, –2).
Left Side Right Side
$2x + y$ 6
$= 2(-4) + (-2)$
$= -10$
Left Side $\ngeq$ Right Side

Try (6, –4).
Left Side Right Side
$2x + y$ 6
$= 2(6) + (-4)$
$= 8$
Left Side ≥ Right Side

The ordered pairs (3, 1) and (6, –4) are solutions to the inequality $2x + y \geq 6$.

Section 9.1 Page 472 Question 2

a) $y > -x + 1$

Try (1, 0).
Left Side Right Side
y $-x + 3$
$= 0$ $= -1 + 3$
  $= 2$
Left Side $\ngtr$ Right Side

Try (–2, 1).
Left Side Right Side
y $-x + 3$
$= 1$ $= -(-2) + 3$
  $= 5$
Left Side $\ngtr$ Right Side

Try (4, 7).

Left Side	Right Side
y	$-x + 3$
$= 7$	$= -4 + 3$
	$= -1$

Left Side > Right Side

Try (10, 8).

Left Side	Right Side
y	$-x + 3$
$= 8$	$= -10 + 3$
	$= -7$

Left Side > Right Side

The ordered pairs (1, 0) and (–2, 1) are not solutions to the inequality $y > -x + 1$.

b) $x + y \geq 6$

Try (2, 4).

Left Side	Right Side
$x + y$	6
$= 2 + 4$	
$= 6$	

Left Side = Right Side

Try (–5, 8).

Left Side	Right Side
$x + y$	6
$= (-5) + 8$	
$= 3$	

Left Side $\not\geq$ Right Side

Try (4, 1).

Left Side	Right Side
$x + y$	6
$= 4 + 1$	
$= 5$	

Left Side $\not\geq$ Right Side

Try (8, 2).

Left Side	Right Side
$x + y$	6
$= 8 + 2$	
$= 10$	

Left Side ≥ Right Side

The ordered pairs (–5, 8) and (4, 1) are not solutions to the inequality $x + y \geq 6$.

c) $4x - 3y < 10$

Try (1, 3).

Left Side	Right Side
$4x - 3y$	10
$= 4(1) - 3(3)$	
$= -5$	

Left Side < Right Side

Try (5, 1).

Left Side	Right Side
$4x - 3y$	10
$= 4(5) - 3(1)$	
$= 17$	

Left Side $\not<$ Right Side

Try (–2, –3).

Left Side	Right Side
$4x - 3y$	10
$= 4(-2) - 3(-3)$	
$= 1$	

Left Side < Right Side

Try (5, 6).

Left Side	Right Side
$4x - 3y$	10
$= 4(5) - 3(6)$	
$= 2$	

Left Side < Right Side

The ordered pair (5, 1) is not a solution to the inequality $4x - 3y < 10$.

d) $5x + 2y \le 9$

Try (0, 0).

Left Side	Right Side
$5x + 2y$	9
$= 5(0) + 2(0)$	
$= 0$	

Left Side $\le$ Right Side

Try (3, –1).

Left Side	Right Side
$5x + 2y$	9
$= 5(3) + 2(-1)$	
$= 13$	

Left Side $\not\le$ Right Side

Try (–4, 2).

Left Side	Right Side
$5x + 2y$	9
$= 5(-4) + 2(2)$	
$= -16$	

Left Side $\le$ Right Side

Try (1, –2).

Left Side	Right Side
$5x + 2y$	9
$= 5(1) + 2(-2)$	
$= 1$	

Left Side $\le$ Right Side

The ordered pair (3, –1) is not a solution to the inequality $5x + 2y \le 9$.

Section 9.1 Page 472 Question 3

a) $y \le x + 3$

The equation is in the $y = mx + b$ form.

The slope is 1 and the y-intercept is 3.

The boundary should be a solid line because $y = x + 3$ is included.

b) $y > 3x + 5$

The equation is in the $y = mx + b$ form.

The slope is 3 and the y-intercept is 5.

The boundary should be a dashed line because $y = 3x + 5$ is not included.

c) $4x + y > 7$

Express in the $y = mx + b$ form.

$y > -4x + 7$

The slope is –4 and the y-intercept is 7.

The boundary should be a dashed line because $4x + y = 7$ is not included.

d) $2x - y \le 10$

Express in the $y = mx + b$ form.

$2x - 10 \le y$ or $y \ge 2x - 10$

The slope is 2 and the y-intercept is –10.

The boundary should be a solid line because $2x - y = 10$ is included.

e) $4x + 5y \geq 20$

$$5y \geq -4x + 20$$

$$y \geq -\frac{4}{5}x + 4$$

The slope is $-\frac{4}{5}$ and the y-intercept is 4.

The boundary should be a solid line because $4x + 5y = 20$ is included.

f) $x - 2y < 10$

$$x - 10 < 2y$$

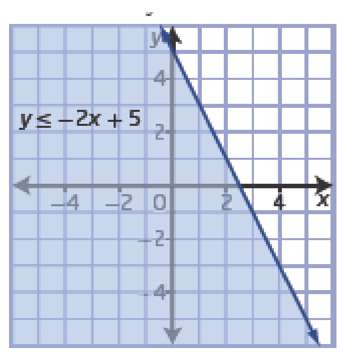
$$y > \frac{1}{2}x - 5$$

The slope is $\frac{1}{2}$ and the y-intercept is -5.

The boundary should be a dashed line because $x - 2y = 10$ is not included.

Section 9.1 Page 472 Question 4

a) $y \leq -2x + 5$



The slope is -2 and the y-intercept is 5.
The x-intercept is 2.5.
Use a solid line for the boundary,
because $y = -2x + 5$ is included.
Verify that the region to shade is below
the line. Try (0, 0).

Left Side	Right Side
= 0	= –2(0) + 5
	= 5

Left Side ≤ Right Side
The graph of the solution region is correct.

b) $3y - x > 8$

$$3y > x + 8$$

$$y > \frac{1}{3}x + \frac{8}{3}$$

The slope is $\frac{1}{3}$ and the y-intercept is $\frac{8}{3}$.

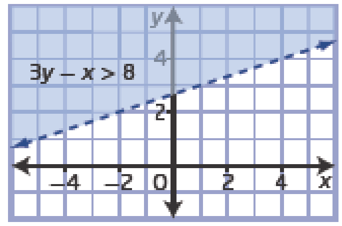
The x-intercept is -8.

Use a dashed line for the boundary, because $3y - x = 8$ is not included.

Verify that the region to shade is above the line.
Try (0, 4).

Left Side	Right Side
$= 3(4) - 0$	$= 8$
$= 12$	

Left Side > Right Side



The graph of the solution region is correct.

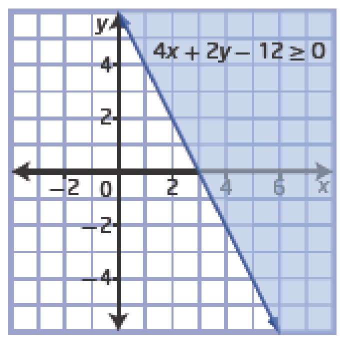
c) $4x + 2y - 12 \geq 0$

$$2y \geq -4x + 12$$
$$y \geq -2x + 6$$

The slope is –2 and the y-intercept is 6.
The x-intercept is 3.
Use a solid line for the boundary, because $4x + 2y - 12 = 0$ is included.
Verify that the region to shade is above the line. Try (4, 0).

Left Side	Right Side
$= 4(4) + 2(0) - 12$	$= 0$
$= 4$	

Left Side > Right Side
The graph of the solution region is correct.



d) $4x - 10y < 40$

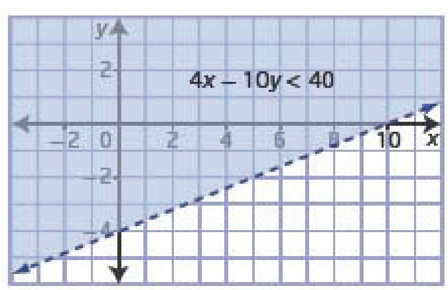
$$4x - 40 < 10y$$
$$y > 0.4x - 4$$

The slope is 0.4 and the y-intercept is –4.
The x-intercept is 10.
Use a dashed line for the boundary, because $4x - 10y = 40$ is not included.

Verify that the region to shade is above the line.
Try (0, 0).

Left Side	Right Side
$= 4(0) - 10(0)$	$= 40$
$= 0$	

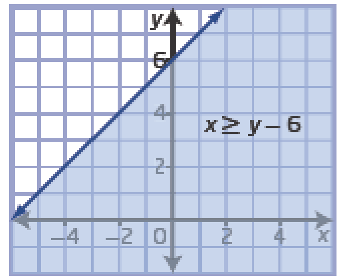
Left Side < Right Side
The graph of the solution region is correct.



e) $x \geq y - 6$
$x + 6 \geq y$ or $y \leq x + 6$
The slope is 1 and the y-intercept is 6.
The x-intercept is –6.
Use a solid line for the boundary, because
$x = y - 6$ is included.
Verify that the region to shade is below the line.
Try (0, 0).

Left Side	Right Side
= 0	= 0 – 6
	= –6

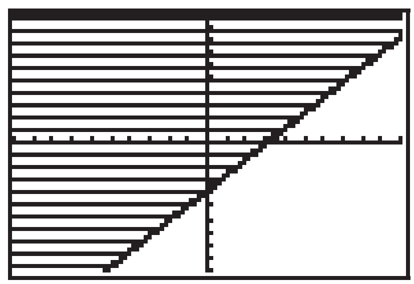
Left Side > Right Side
The graph of the solution region is correct.



Section 9.1 Page 472 Question 5

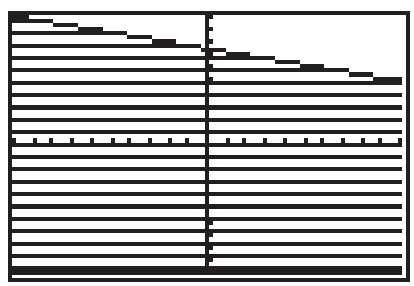
a) $6x - 5y \leq 18$

$$\frac{6}{5}x - \frac{18}{5} \leq y \text{ or } y \geq \frac{6}{5}x - \frac{18}{5}$$



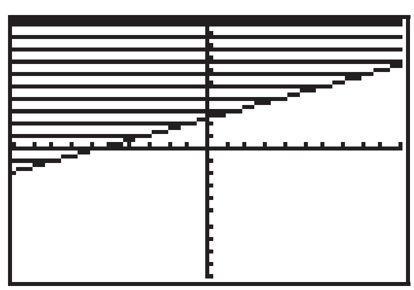
b) $x + 4y < 30$

$$y < -\frac{1}{4}x + \frac{15}{2}$$



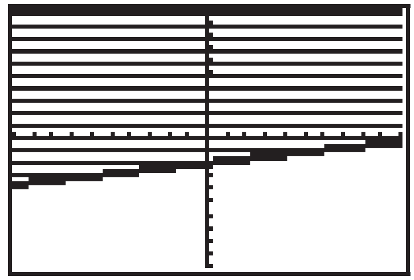
c) $-5x + 12y - 28 > 0$

$$y > \frac{5}{12}x + \frac{7}{3}$$



d) $x \le 6y + 11$

$\frac{1}{6}x - \frac{11}{6} \le y$ or $y \ge \frac{1}{6}x - \frac{11}{6}$



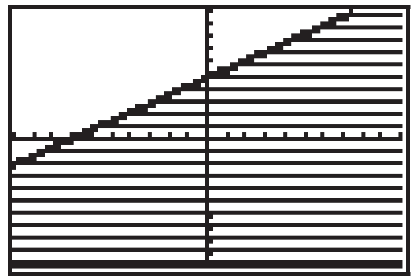
e)

$3.6x - 5.3y + 30 \ge 4$

$3.6x + 30 - 4 \ge 5.3y$

$3.6x + 26 \ge 5.3y$

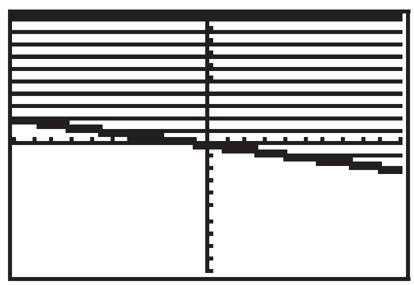
$\frac{36}{53}x + \frac{260}{53} \ge y$ or $y \le \frac{36}{53}x + \frac{260}{53}$



Section 9.1 Page 472 Question 6

$-5y \le x$

$y \ge -\frac{1}{5}x$

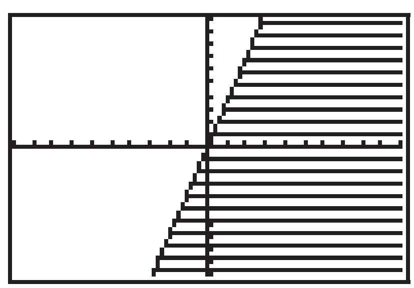


Section 9.1 Page 472 Question 7

$7x - 2y > 0$

$7x > 2y$

$\frac{7}{2}x > y$ or $y < \frac{7}{2}x$



Section 9.1 Page 472 Question 8

a) $6x + 3y \ge 21$

$3y \ge -6x + 21$

$y \ge -2x + 7$

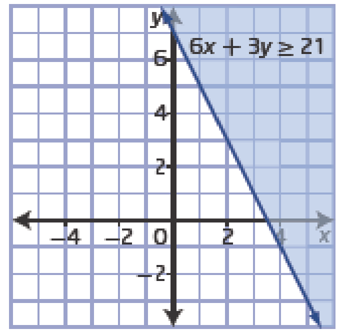
From the equation, the y-intercept is 7 and the slope is –2, so this can be graphed by hand. The boundary $y = -2x + 7$ is included, so use a solid line. Shade above the line.

Verify using (4, 0).

Left Side	Right Side
$6x + 3y$	21
$= 6(4) + 3(0)$	
$= 24$	

Left Side > Right Side

The correct region is shaded.



b) $10x < 2.5y$

$4x < y$ or $y > 4x$

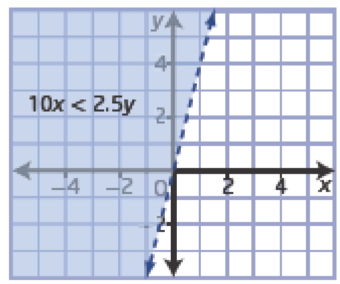
For the line $y = 4x$, the slope is 4 and the y-intercept is 0. This can be graphed by hand. The boundary $y = 4x$ is not included, so use a dashed line. Shade above the line.

Test the point (0, 2).

Left Side	Right Side
$10x$	$2.5y$
$= 10(0)$	$= 2.5(2)$
$= 0$	$= 5$

Left Side < Right Side

The correct region is shaded.



c) $2.5x < 10y$

$\frac{1}{4}x < y$ or $y > \frac{1}{4}x$

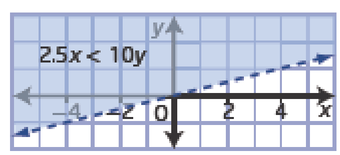
The boundary line has equation $y = \frac{1}{4}x$. Its slope is $\frac{1}{4}$ and y-intercept is 0. This line can be graphed by hand. The line is not included, so use a dashed line. Shade above the line.

Test (0, 1).

Left Side	Right Side
$2.5x$	$10y$
$= 2.5(0)$	$= 10(1)$
$= 0$	$= 10$

Left Side < Right Side

The correct region is shaded.

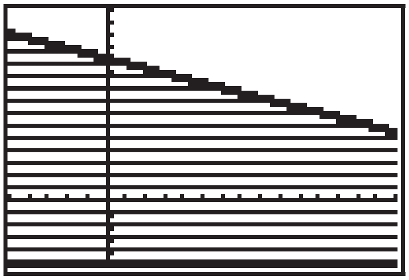


d) $4.89x + 12.79y \le 145$

$$12.79y \le -4.89x + 145$$

$$y \le -\frac{489}{1279}x + \frac{14\ 500}{1279}$$

Since the numbers are not nice, use a graphing calculator.

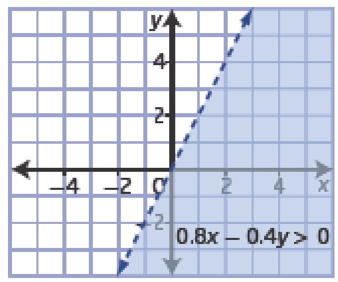


e) $0.8x - 0.4y > 0$

$8x > 4y$

$2x > y$ or $y < 2x$

The boundary is the line $y = 2x$. Its slope is 2 and y-intercept is 0. This can be graphed by hand. The line is not included, so use a dashed line. Shade below the line.



Test (1, 0).

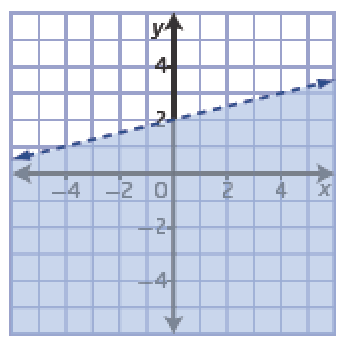
Left Side	Right Side
$0.8x - 0.4y$	0
$= 0.8(1) - 0.4(0)$	
$= 0.8$	

Left Side > Right Side

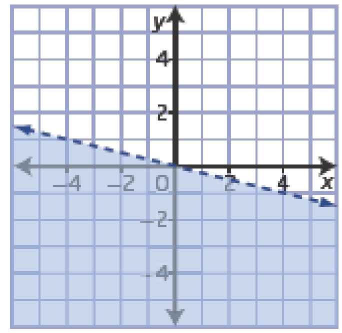
The correct region is shaded.

Section 9.1 Page 472 Question 9

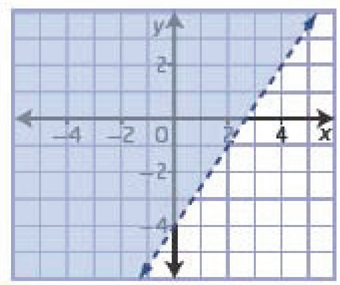
a) From the graph, the y-intercept of the boundary line is 2 and the slope is $\frac{1}{4}$. So the equation of the boundary line is $y = \frac{1}{4}x + 2$. Since the region shaded is below a dashed line, the inequality shown is $y < \frac{1}{4}x + 2$.



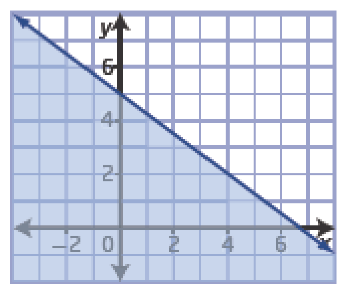
b) From the graph, the y-intercept of the boundary line is 0 and the slope is $-\frac{1}{4}$. So the equation of the boundary line is $y = -\frac{1}{4}x$. Since the region shaded is below a dashed line, the inequality shown is $y < -\frac{1}{4}x$.



c) From the graph, the y-intercept of the boundary line is –4 and the slope is $\frac{3}{2}$. So the equation of the boundary line is $y = \frac{3}{2}x - 4$. Since the region shaded is above a dashed line, the inequality shown is $y > \frac{3}{2}x - 4$.

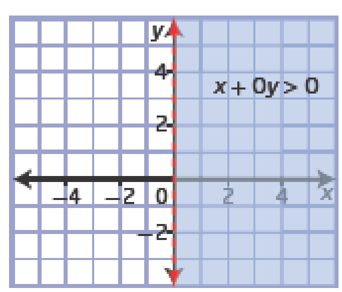


d) From the graph, the y-intercept of the boundary line is 5 and the slope is $-\frac{3}{4}$. So the equation of the boundary line is $y = -\frac{3}{4}x + 5$. Since the region shaded is below a solid line, the inequality shown is $y \le -\frac{3}{4}x + 5$.



Section 9.1 Page 473 Question 10

$x + 0y > 0$
The inequality simplifies to $x > 0$.
The line $x = 0$ is the y-axis, so all of the plane to the right of the y-axis is the region where $x > 0$.



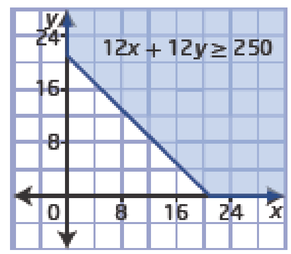
Section 9.1 Page 473 Question 11

a) Let x represent the number of hours Amaruq works and let y represent the number of pairs of baby moccasins she sells. If she wants to earn at least \$250, then
$12x + 12y \geq 250$, where $x \geq 0$ and $y \geq 0$.

b) Rearrange the equation of the boundary line $12x + 12y = 250$, to the $y = mx + b$ form.

$$12y = -12x + 250$$
$$y = -x + \frac{250}{12}$$
$$y = -x + 20\frac{5}{6}$$

So, the slope of the line is –1 and the y-intercept is $20\frac{5}{6}$. Because the slope is –1, the x-intercept must also be $20\frac{5}{6}$. Use the two intercepts to graph the boundary. Shade the region above the line and in the first quadrant because only positive values make sense in the context.



c) Examples: (24, 4) or 24 h work and sells 4 pairs of moccasins, (8, 16) or 8 h worked and sells 16 pairs of moccasins, (25, 0) or works 25 h and sells no moccasins.

d) Amaruq may have some weeks when she is not able to sell any moccasins, so her part-time job will provide some steady guaranteed income.

Section 9.1 Page 473 Question 12

a) Let x represent the number of hours Camille works with the elder and let y represent the number of hours of marketing assistance. If she wants to spend at most \$3000, then $30x + 50y \leq 3000$, where $x \geq 0$ and $y \geq 0$.

b) From the equation of the boundary line $30x + 50y = 3000$, the x-intercept is at (110, 0) and the y-intercept is at (0, 60). Use the two intercepts to graph the boundary. Shade the region below the line and in the first quadrant because only positive values make sense in the context.