

Answers to Problem 4.4

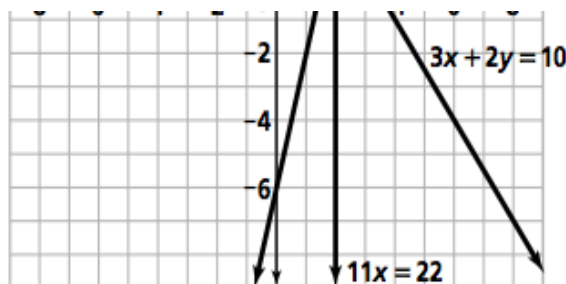
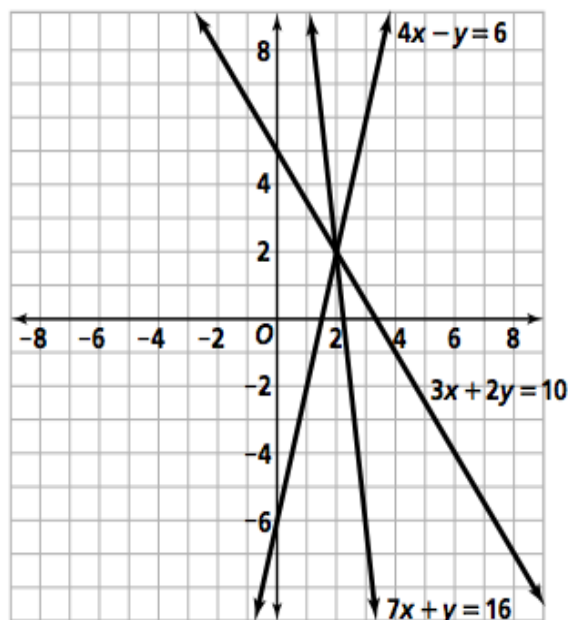
- A. 1. $6y = 8$ or $y = \frac{4}{3}$, $x = 5 - 2(\frac{4}{3})$ or $x = \frac{7}{3}$
 2. $3x = -12$ or $x = -4$, $2(-4) + 3y = 4$ or $y = 4$
 3. $3x = 3$ or $x = 1$, $2(1) - 3y = 4$ or $y = -\frac{2}{3}$

- B. 1. We have simply multiplied both sides of the second equation by 2. Every pair (x, y) satisfying the first equation will satisfy the second and vice versa.

$$2. \begin{cases} 3x + 2y = 10 \\ 8x - 2y = 12 \end{cases}$$

$$\begin{aligned} \text{Therefore, } 11x &= 22 \\ x &= 2 \\ y &= 2 \\ (2, 2) \end{aligned}$$

- C. 1. $7x + y = 16$

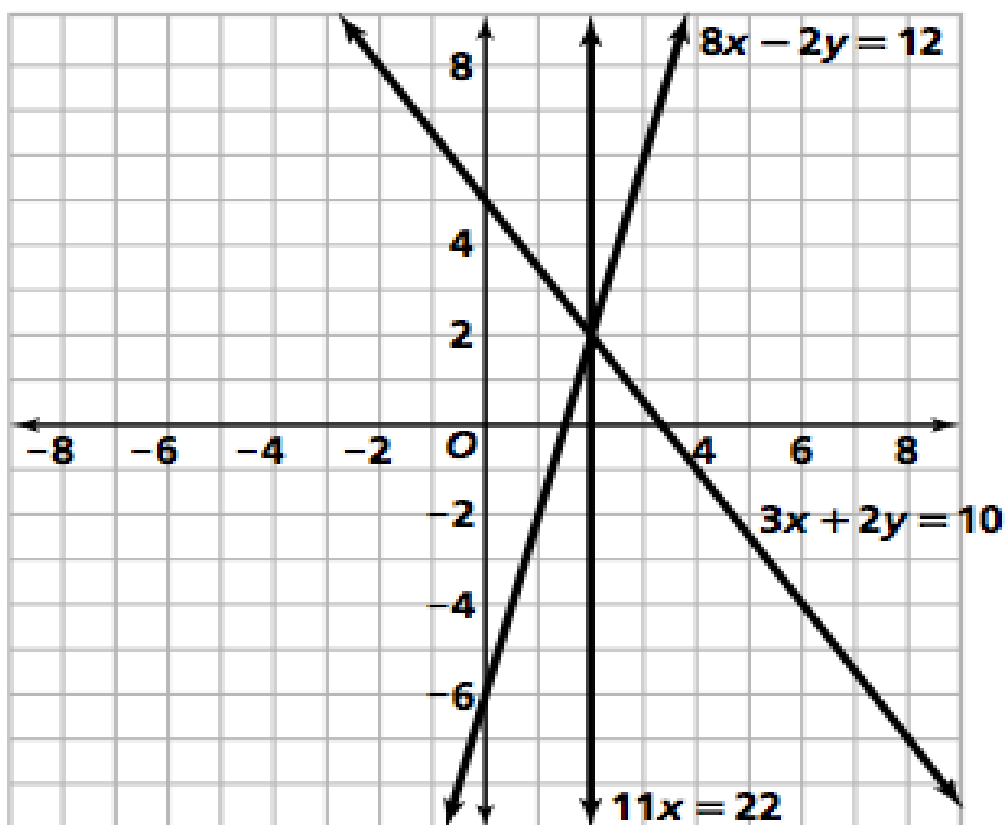


They all intersect at a unique common point.

3. The new equation is $x = 2$, which is the x-coordinate of the solution for the system.
- D. 1. The simplest strategy is probably to multiply the first equation by 3 (though other methods are correct, if less efficient). Then adding the two equations of the new system yields $9x = 27$, $x = 3$, and $y = -0.5$.
2. Here again, multiplying the first equation by 3 is probably the simplest and most efficient transformation to apply. Then subtracting the second equation from the first yields $5y = 10$, $y = 2$, and $x = -2$.
- E. 1. Choices of solution method will vary. The solution to each system is listed.
- a. $(4, -3)$ b. $(6\frac{1}{2}, -\frac{3}{4})$
- c. $(2, \frac{1}{2})$
- d. The solution set is infinite. The two equations in the system are equivalent.
- e. The solution set is infinite. The two equations in the system are equivalent.
2. Strategies will vary.
- F. One might notice that the second equation in each case is an integer multiple of the first.

The graph of the new equation intersects the other graphs at their previous point of intersection.

2.



They all intersect at a unique common point.

3. The new equation is $x = 2$, which is the x -coordinate of the solution for the system.

21. $(x, y) = (\frac{14}{3}, 1)$

ACE p. 60 #21-26 solutions

22. $(x, y) = (2, -\frac{1}{9})$

23. $(x, y) = (-3, -2)$

24. $(x, y) = (-4, 2)$

25. $(x, y) = (-1.5, -3)$

26. One approach multiplies the second equation by 2 and then adds it to the first:

$$\begin{cases} 2x - 3y = 14 \\ -2x + 6y = -12 \end{cases}$$

$$3y = 2; y = \frac{2}{3}$$

$$2x - 3(\frac{2}{3}) = 14$$

$$2x = 16$$

$$x = 8$$

$$(x, y) = (8, \frac{2}{3})$$

(Or you could add both equations together to get $x = 8$ directly.)

ACE #25

(25.) $\begin{cases} -6x - 4y = 21 \\ -6x + 3y = 0 \end{cases}$ ^{1st} $\Rightarrow \begin{cases} -6x - 4y = 21 \\ 6x - 3y = 0 \end{cases}$

(2ND)

$$\begin{array}{rcl} -6x - 4y & = & 21 \\ -6x - 4(-3) & = & 21 \\ -6x + 12 & = & 21 \\ \underline{-12 \quad -12} & & \\ -6x & = & 9 \\ \underline{-6} & & \underline{-6} \\ x & = & -\frac{9}{6} = -\frac{3}{2} \end{array}$$

$$\begin{array}{rcl} -7y & = & 21 \\ \underline{-7} & & \underline{-7} \\ y & = & -3 \end{array}$$

$$\left(-\frac{3}{2}, -3 \right)$$

solving a linear system by combination method

$$\begin{cases} 2(-3x + y = -7) & \Rightarrow & 2(-6x + 2y = -14) \\ 3(2x + 2y = 10) & & 3(6x + 6y = 30) \end{cases}$$

$$2x + 2y = 10$$

$$2x + 2(2) = 10$$

$$2x + 4 = 10$$

$$\begin{array}{r} -4 \quad -4 \\ \hline \end{array}$$

$$\begin{array}{r} 2x = 6 \\ \hline 2 \end{array}$$

$$x = 3$$

$$\begin{array}{r} 8y = 16 \\ \hline 8 \end{array}$$

$$y = 2$$

$$\boxed{(3, 2)}$$

graphing a linear inequality

$$2x + y < 6$$

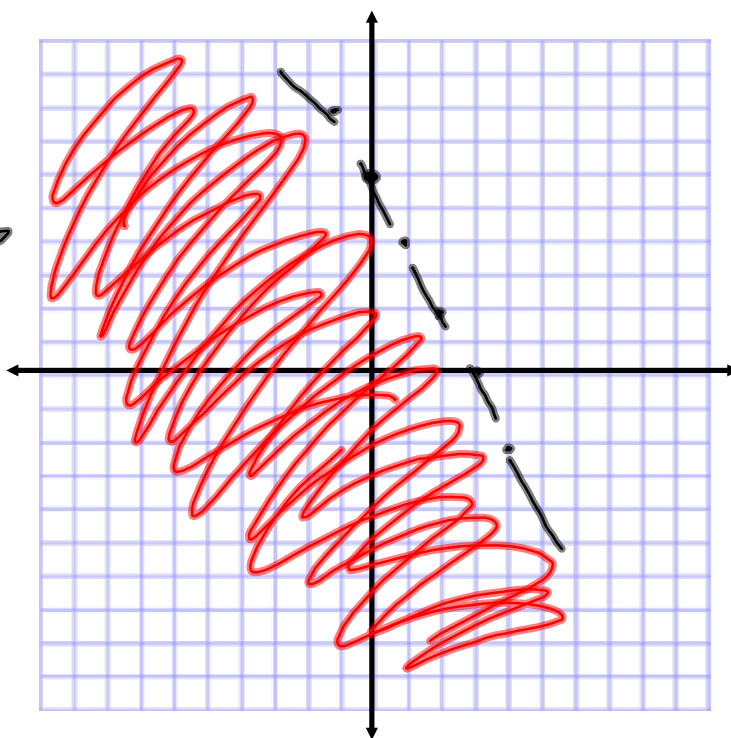
1st graph $2x + y = 6$

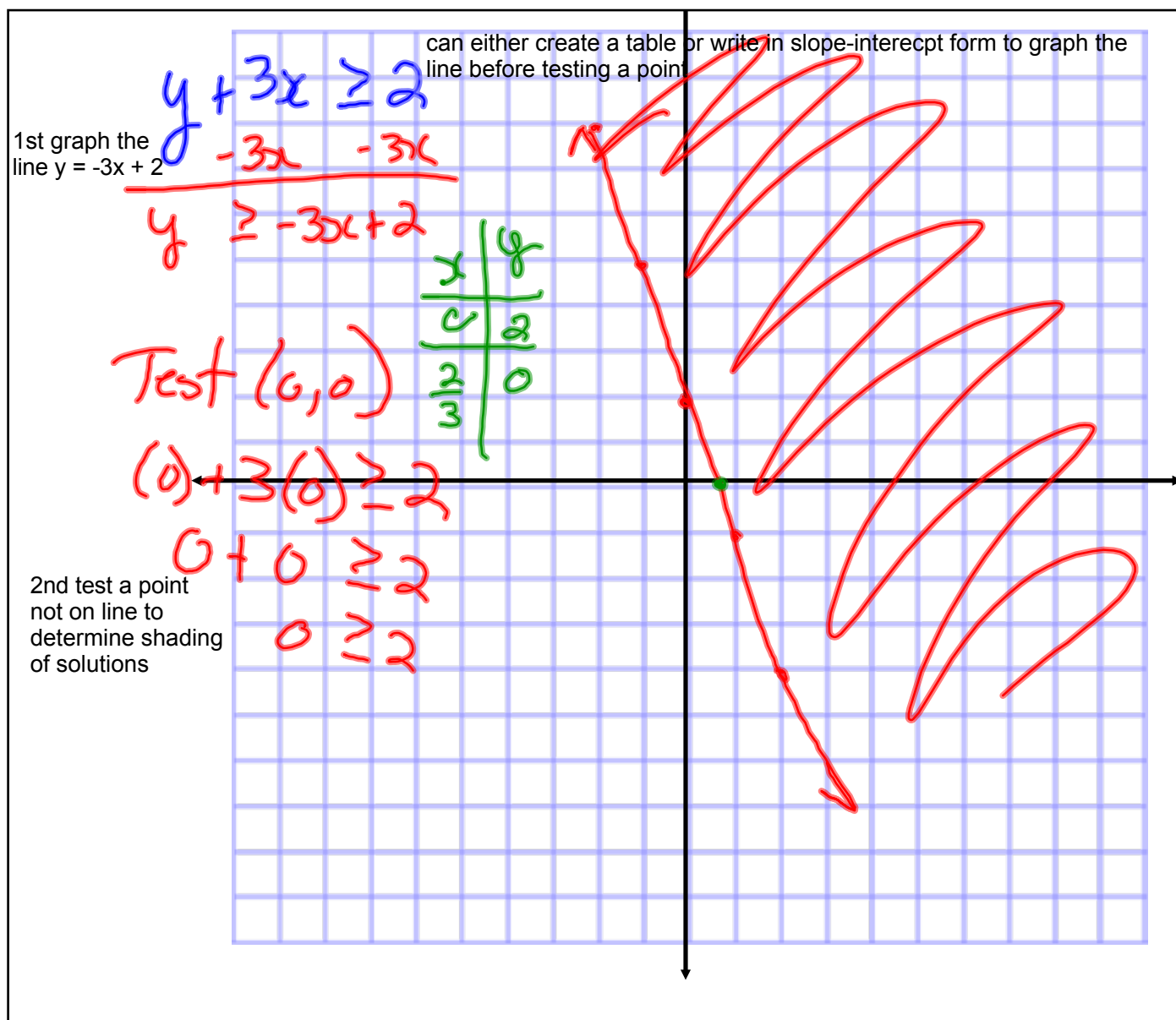
$$\begin{array}{r} -2x \quad -2x \\ \hline y = -2x + 6 \end{array}$$

2nd Test $(0,0)$

$$2(0) + (0) < 6$$

$$0 < 6$$





graphing a linear inequality

$$2x + 3y \leq 12$$

1st graph $2x + 3y = 12$

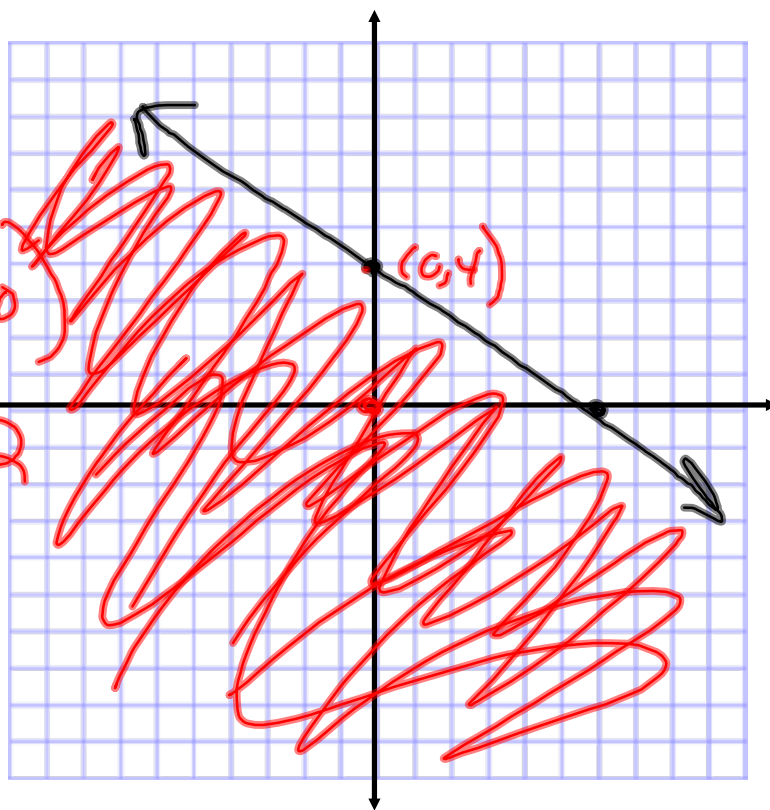
x	0	6
y	4	0

2nd

Test point (0,0)

$$2(0) + 3(0) \leq 12$$

$$0 \leq 12$$



$$y + 4x < -3$$

dotted line used when no equal sign because now the points on the line are not solutions

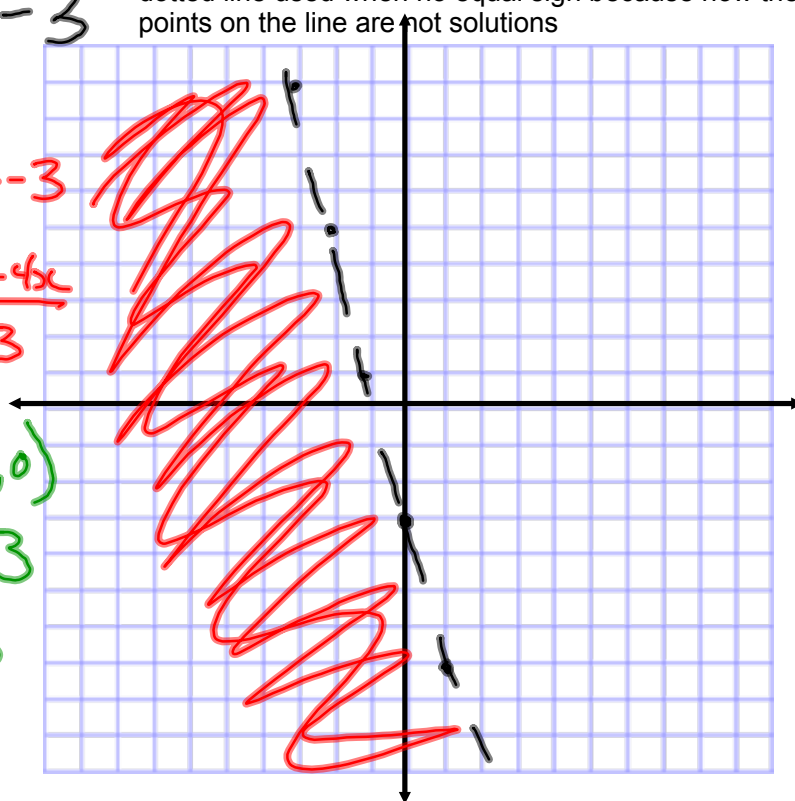
1st graph $y + 4x = -3$

$$\begin{array}{r} -4x \quad -4x \\ \hline y = -4x - 3 \end{array}$$

2nd test point $(0,0)$

$$(0) + 4(0) < -3$$

$$0 < -3$$



graphing a system of linear inequalities

$$\begin{cases} 2x + 3y \leq 6 \\ 2x + y \leq 2 \end{cases}$$

x	0	3
y	2	0

x	0	1
y	2	0

1st create the boundary lines for each inequality by either using a table to find the intercepts or writing them in slope-intercept form

2nd test a point for each to find where the shared shading area of solution is and shade

