

Chapter 4 Test Review p. 304

$$1. \begin{cases} 2x - 3y = 12 \\ 3x + 4y = 1 \end{cases}$$

$$a) \begin{aligned} 2(12) - 3(4) &= 12 \\ 24 - 12 &= 12 \checkmark \end{aligned}$$

$$b) \begin{aligned} 2(3) - 3(-2) &= 12 \\ 6 + 6 &= 12 \checkmark \end{aligned}$$

$$c) \begin{aligned} 2(-3) - 3(6) &= 12 \\ -6 - 18 &= 12 \times \end{aligned}$$

$$\begin{aligned} 3(12) + 4(4) &= 1 \\ 36 + 12 &= 1 \times \end{aligned}$$

$$\begin{aligned} 3(3) + 4(-2) &= 1 \\ 9 - 8 &= 1 \checkmark \end{aligned}$$

NO

NO

Yes

$$2. \begin{cases} 4x + y = 0 \\ -8x - 5y = 9 \end{cases}$$

$$a) \begin{aligned} 4\left(\frac{3}{4}\right) + (-3) &= 0 \\ 3 + -3 &= 0 \checkmark \end{aligned}$$

$$b) \begin{aligned} 4(-2) + 8 &= 0 \\ -8 + 8 &= 0 \end{aligned}$$

$$c) \begin{aligned} 4\left(\frac{1}{2}\right) - 2 &= 0 \\ 2 - 2 &= 0 \end{aligned}$$

$$\begin{aligned} -8\left(\frac{3}{4}\right) - 5(-3) &= 9 \\ -6 + 15 &= 9 \end{aligned}$$

$$\begin{aligned} -8(-2) - 5(8) &= 9 \\ 16 - 40 &= 9 \end{aligned}$$

$$\begin{aligned} -8\left(\frac{1}{2}\right) - 5(-2) &= 9 \\ -4 + 10 &= 9 \end{aligned}$$

Yes

NO

NO

$$3. \begin{cases} 5x - 6y = 18 \\ 2y - x = -4 \end{cases}$$

$$a) \begin{aligned} 5(-6) - 6(-8) &= 18 \\ -30 + 48 &= 18 \end{aligned}$$

$$b) \begin{aligned} 5(3) - 6\left(\frac{5}{2}\right) &= 18 \\ 15 - 15 &= 18 \times \end{aligned}$$

$$c) \begin{aligned} 5(3) - 6\left(-\frac{1}{2}\right) &= 18 \\ 15 + 3 &= 18 \end{aligned}$$

$$\begin{aligned} 2(-8) - (-6) &= -4 \\ -16 + 6 &= -4 \end{aligned}$$

$$\begin{aligned} 2\left(-\frac{1}{2}\right) - (3) &= -4 \\ -1 - 3 &= -4 \end{aligned}$$

NO

NO

Yes

$$4. \begin{cases} 2x + 3y = 1 \\ 3y - x = 4 \end{cases}$$

$$a) \begin{cases} 2(2) + 3(2) = 1 \\ 4 + 6 = 1 \end{cases}$$

NO

$$b) \begin{cases} 2(-1) + 3(1) = 1 \\ -2 + 3 = 1 \end{cases}$$

$$3(1) - (-1) = 4 \\ 3 + 1 = 4$$

Yes

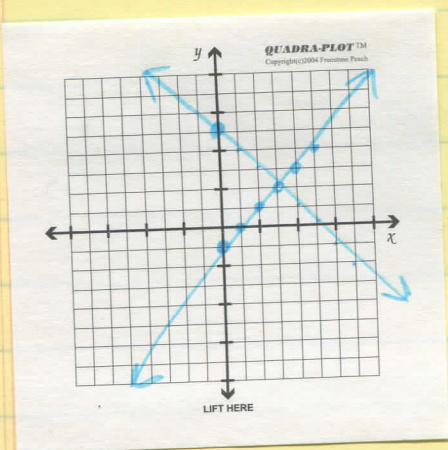
$$c) \begin{cases} 2(2) + 3(-1) = 1 \\ 3(-1) - (2) = 4 \end{cases}$$

$$4 - 3 = 1 \checkmark \\ -3 - 2 \neq 4$$

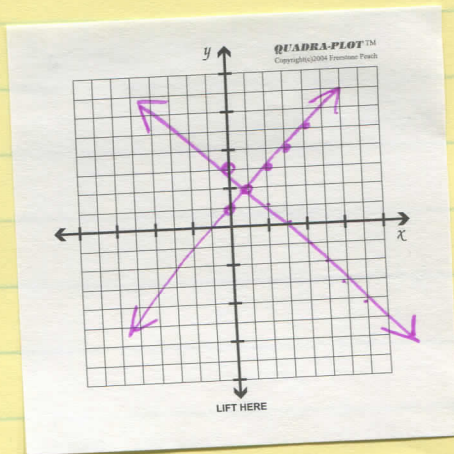
NO

$$5. \begin{cases} x + y = 5 \\ x - y = 1 \end{cases} \quad \begin{cases} y = -x + 5 \\ y = x - 1 \end{cases}$$

$$6. \begin{cases} x + y = 3 \\ x - y = -1 \end{cases} \quad \begin{cases} y = -x + 3 \\ y = x + 1 \end{cases}$$



(3, 2)



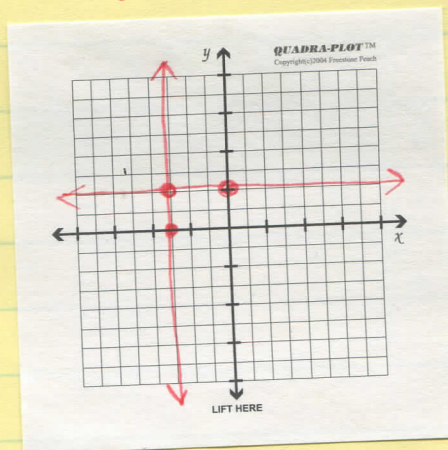
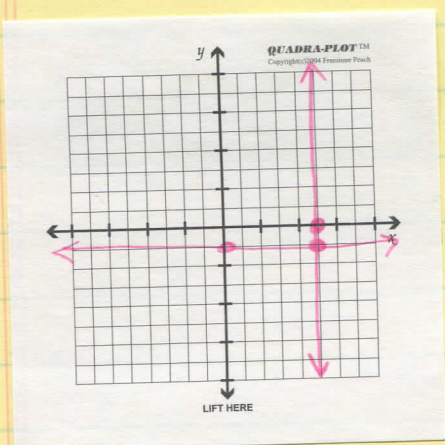
(1, 2)

$$7. \begin{cases} x = 5 \\ y = -1 \end{cases}$$

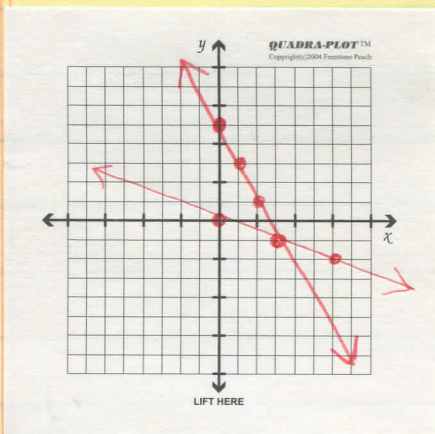
(5, -1)

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

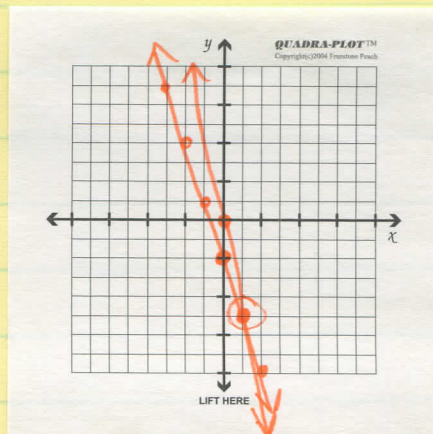
(3, 2)



9. $\begin{cases} 2x + y = 5 \\ x = -3y \end{cases}$ $y = -2x + 5$ $y = \frac{1}{3}x$ 10. $\begin{cases} 3x + y = -2 \\ y = -5x \end{cases}$ $y = -3x - 2$ $y = -5x$

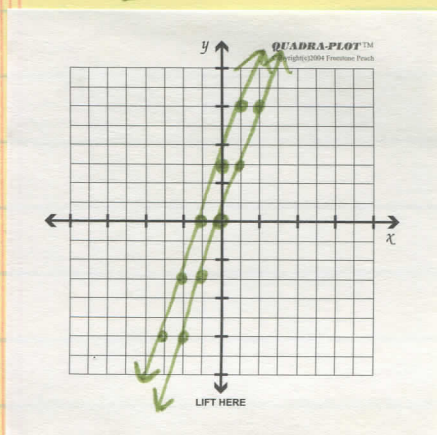


$(3, -1)$



$(1, -5)$

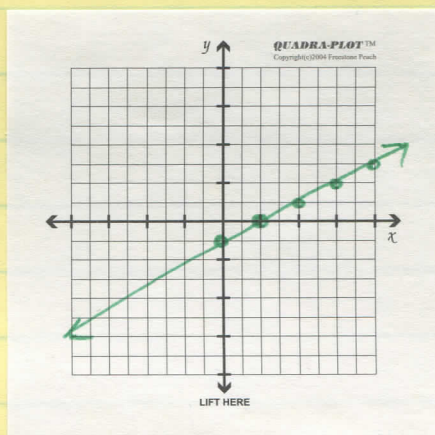
11. $\begin{cases} y = 3x \\ -6x + 2y = 6 \end{cases}$
 $y = 3x + 3$



\emptyset

//
 \leftrightarrow

12. $\begin{cases} x - 2y = 2 \\ -2x + 4y = -4 \end{cases}$ $y = \frac{1}{2}x - 1$
 $y = \frac{1}{2}x - 1$



∞

Coinciding
 \leftrightarrow

13. $y = 2x + 6$
 $3x - 2y = -11$
 $3x - 2(2x + 6) = -11$
 $3x - 4x - 12 = -11$
 $-x - 12 = -11$
 $-x = 1$

$x = -1$ $y = 4$

$y = 2(-1) + 6$
 $= -2 + 6 = 4$ $(-1, 4)$

14. $\begin{cases} y = 3x - 7 \\ 2x - 3y = 7 \end{cases}$ $y = 3(2) - 7$
 $= 6 - 7$
 $y = -1$
 $2x - 3(3x - 7) = 7$
 $2x - 9x + 21 = 7$
 $-7x + 21 = 7$
 $-7x = -14$

$x = 2$

$(2, -1)$

$$15. \begin{cases} x + 3y = -3 \\ 2x + y = 4 \\ y = -2x + 4 \end{cases}$$

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

$$x - 6x + 12 = -3$$

$$\underline{-5x + 12 = -3}$$

$$\underline{-5x = -15}$$

$$\boxed{x = 3}$$

$$3 + 3y = -3$$

$$\underline{3y = -6}$$

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

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

$$17. \begin{cases} 4y = 2x + 6 \\ x - 2y = -3 \end{cases} \quad x = 2y - 3$$

$$4y = 2(2y - 3) + 6$$

$$4y = 4y - 6 + 6$$

$$4y = 4y \quad \checkmark$$

$$\boxed{\infty}$$

infinitely many solutions

$$16. \begin{cases} 3x + y = 11 & y = -3x + 11 \\ x + 2y = 12 \end{cases}$$

$$x + 2(-3x + 11) = 12$$

$$x - 6x + 22 = 12$$

$$\underline{-5x + 22 = 12}$$

$$\underline{-5x = -10}$$

$$\boxed{x = 2}$$

$$\boxed{(2, 5)}$$

$$2 + 2y = 12$$

$$\underline{2y = 10}$$

$$\boxed{y = 5}$$

$$18. \begin{cases} 9x = 6y + 3 & x = \frac{2}{3}y + \frac{1}{3} \\ 6x - 4y = 2 \end{cases}$$

$$6\left(\frac{2}{3}y + \frac{1}{3}\right) - 4y = 2$$

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

$$2 = 2$$

$$\boxed{\infty}$$

infinitely many solutions

$$19. \begin{cases} x + y = 6 \\ y = -x - 4 \end{cases}$$

$$x + (-x - 4) = 6$$

$$\underline{-4 \neq 6 \quad \times}$$

$\boxed{\emptyset}$ no solution

$$20. \begin{cases} -3x + y = 6 \\ y = 3x + 2 \end{cases}$$

$$\underline{-3x + (3x + 2) = 6}$$

$$\underline{2 \neq 6 \quad \times}$$

$\boxed{\emptyset}$ no solution

$$21. \begin{cases} 2x + 3y = -6 \\ x - 3y = -12 \end{cases}$$

$$3x = -18$$

$$x = -6$$

$$-6 - 3y = -12$$

$$-3y = -6$$

$$y = 2$$

$$(-6, 2)$$

$$22. \begin{cases} 4x + y = 15 \\ 4x + 3y = -19 \end{cases}$$

$$4y = -4$$

$$y = -1$$

$$4x + (-1) = 15$$

$$(4, -1)$$

$$4x = 16$$

$$x = 4$$

$$23. \begin{cases} 2x - 3y = -15 \\ x + 4y = 31 \end{cases}$$

$$2x - 3y = -15$$

$$-2x - 8y = -62$$

$$-11y = -77$$

$$y = 7$$

$$x + 4(7) = 31$$

$$(3, 7)$$

$$x + 28 = 31$$

$$x = 3$$

$$24. \begin{cases} x - 5y = -22 \quad (-4) \\ 4x + 3y = 4 \end{cases}$$

$$4x + 3y = 4$$

$$-4x + 20y = 88$$

$$+ 4x + 3y = 4$$

$$23y = 92$$

$$y = 4$$

$$(-2, 4)$$

$$x - 5(4) = -22$$

$$x - 20 = -22$$

$$x = -2$$

$$25. \begin{cases} 2x - 6y = -1 \\ -x + 3y = \frac{1}{2} \end{cases}$$

$$2x - 6y = -1$$

$$-2x + 6y = 1$$

$$0 = 0 \checkmark$$

∞ infinitely many solutions

$$26. \begin{cases} 0.6x - 0.3y = -1.5 \quad (10) \\ 0.04x - 0.02y = -0.1 \quad (100) \end{cases}$$

$$(2) \begin{cases} 6x - 3y = -15 \\ 4x - 2y = -10 \end{cases}$$

$$(3) \begin{cases} 4x - 2y = -10 \\ -12x + 6y = 30 \end{cases}$$

$$+12x - 6y = -30$$

$$0 = 0 \checkmark$$

∞ infinitely many solutions

$$27. \begin{cases} \frac{3}{4}x + \frac{2}{3}y = 2 & (12) \\ x + \frac{y}{3} = 6 & (3) \end{cases}$$

$$\begin{aligned} & \begin{cases} 9x + 8y = 24 \\ 3x + y = 18 \end{cases} \\ -3 & \\ & \begin{cases} 9x + 8y = 24 \\ -9x - 3y = -54 \end{cases} \\ & \hline & 5y = -30 \\ & \boxed{y = -6} \end{aligned}$$

$$\begin{aligned} x + \frac{-6}{3} &= 6 \\ x - 2 &= 6 & \boxed{(8, -6)} \\ \boxed{x = 8} & \end{aligned}$$

$$28. \begin{cases} 10x + 2y = 0 & (5) \\ 3x + 5y = 33 & (-2) \end{cases}$$

$$\begin{aligned} & 50x + 10y = 0 \\ & -6x - 10y = -66 \\ & \hline \end{aligned}$$

$$44x = -66$$

$$x = \frac{-66}{44} \div 11 = \frac{6}{4} \div 2 = \boxed{\frac{-3}{2}}$$

$$\begin{aligned} 10\left(\frac{-3}{2}\right) + 2y &= 0 \\ -15 + 2y &= 0 \\ 2y &= +15 \end{aligned}$$

$$\boxed{y = +\frac{15}{2}}$$

$$\boxed{\left(\frac{-3}{2}, \frac{15}{2}\right)}$$

29-36 SKIP

$$37. \begin{cases} x + y = 16 \\ 3x - y = 72 \end{cases}$$

$$4x = 88$$

$$\boxed{x = 22}$$

$$22 + y = 16$$

$$\boxed{y = -6}$$

The two numbers are -6 & 22 .

$$38. \begin{cases} x + y = 360 & y = 360 - x \\ 45x + 35y = 15,150 \end{cases}$$

$$\begin{aligned} 45x + 35(360 - x) &= 15,150 \\ 45x + 12,600 - 35x &= 15,150 \end{aligned}$$

$$10x = 2550$$

$$\boxed{x = 255}$$

$$255 + y = 360$$

$$\boxed{y = 105}$$

Orchestra section tickets ~~cost~~ sold
255 and balcony section sold
105 tickets.

$$39. \begin{cases} 340 = 19x - 19y \\ 340 = 14x + 14y \end{cases}$$

OMIT

Each egg is \$0.40
and a strip of
bawn \$0.65.

$$41. \begin{cases} 3x + 4y = 3.8 & (-2) \\ 2x + 3y = 2.75 & (3) \end{cases}$$

$$-6x - 8y = -7.6$$

$$+ 6x + 9y = 8.25$$

$$y = 0.65$$

$$2x + 3(0.65) = 2.75$$

$$2x + 1.95 = 2.75$$

$$2x = 0.80$$

$$x = 0.4$$

$$45. \begin{cases} x + x + y = 73 \\ 2x + y = 73 \end{cases}$$

$$y = x + 7$$

$$2x + (x + 7) = 73$$

$$3x + 7 = 73$$

$$3x = 66$$

$$x = 22$$

$$y = 22 + 7$$

$$y = 29$$

The two equal sides
are 22 cm & the
third side is 29cm.

$$47. \begin{cases} x - 2y = 1 \\ 2x + 3y = -12 \end{cases}$$

$$① y = \frac{1}{2}x - \frac{1}{2}$$

$$② y = -\frac{2}{3}x - 4$$

$$(-3, -2)$$

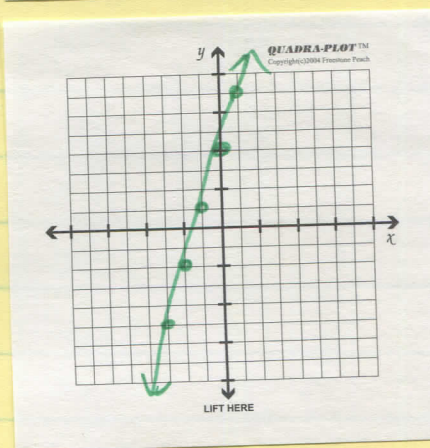
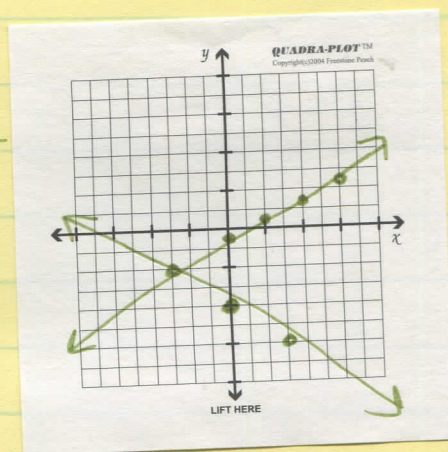
$$48. \begin{cases} 3x - y = -4 \\ 6x - 2y = -8 \end{cases}$$

$$① y = 3x + 4$$

$$② y = 3x + 4$$

∞

coinciding
lines



$$49. \begin{cases} x + 4y = 11 \\ 5x - 9y = -3 \end{cases}$$

$$x = -4y + 11$$

$$5(-4y + 11) - 9y = -3$$

$$-20y + 55 - 9y = -3$$

$$-29y = -58$$

$$\boxed{y = 2}$$

$$x + 4(2) = 11$$

$$x + 8 = 11 \quad \boxed{(3, 2)}$$

$$\boxed{x = 3}$$

$$51. \begin{cases} y = -2x \\ 4x + 7y = -15 \end{cases}$$

$$4x + 7(-2x) = -15$$

$$4x - 14x = -15 \quad \boxed{(\frac{3}{2}, -3)}$$

$$-10x = -15$$

$$\boxed{x = \frac{-15}{-10} \div 5 = \frac{+3}{2}}$$

$$y = -2(\frac{3}{2}) = \boxed{-3}$$

$$53. \begin{cases} 3x - y = 4 \\ 4y = 12x - 16 \end{cases}$$

$$y = 3x - 4$$

$$\frac{-y}{-1} = \frac{-3x + 4}{-1} \quad \boxed{\infty}$$

$$y = 3x - 4$$

coinciding lines

$$50. \begin{cases} x + 9y = 16 \quad (-3) \\ 3x - 8y = 13 \\ \cancel{-3x} - 27y = -48 \\ 3x - 8y = 13 \end{cases}$$

$$\hline -35y = -35$$

$$\boxed{y = 1}$$

$$x + 9(1) = 16$$

$$\boxed{x = 7}$$

$$\boxed{(7, 1)}$$

$$52. \begin{cases} 3y = 2x + 15 \\ -2x + 3y = 21 \end{cases}$$

$$2x - 3y = -15$$

$$\hline 0 \neq 6 \quad x$$

$\boxed{\emptyset}$ No solution

$$54. \begin{cases} x + y = 19 \\ x - y = -3 \end{cases}$$

$$\hline 2x = 16$$

$$\frac{2x}{2} = \frac{16}{2}$$

$$\boxed{x = 8}$$

$$\begin{array}{r} 8 + y = 19 \\ -8 \quad -8 \\ \hline y = 11 \end{array}$$

$$\boxed{y = 11}$$

$$\boxed{(8, 11)}$$

$$55. \begin{cases} x - 3y = -11 & (-4) \\ 4x + 5y = -10 \\ -4x + 12y = 44 \end{cases}$$

$$17y = 34$$

$$\boxed{y = 2}$$

$$x - 3(2) = -11 \quad \boxed{(-5, 2)}$$

$$\begin{array}{r} x - 6 = -11 \\ \hline x = -5 \end{array}$$

$$56. \begin{cases} -x - 15y = 44 & (2) \\ 2x + 3y = 20 \\ -2x - 30y = 88 \end{cases}$$

$$-27y = 108$$

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

$$-x - 15(-4) = 44$$

$$-x + 60 = 44$$

$$-x = -16$$

$$\boxed{x = 16}$$

$$\boxed{(16, -4)}$$

$$58. \begin{cases} x - 4y = 4 \\ \frac{1}{8}x - \frac{1}{2}y = 3 & (8) \end{cases}$$

$$(-1) \begin{cases} x - 4y = 4 \\ x - 4y = 24 \end{cases}$$

$$0 \neq 20 \quad x$$

$\boxed{\emptyset}$ no solution

$$59. \begin{cases} x + y = 12 & (-1) \quad x = 1^{\text{st}} \# \\ 3x + y = 20 \end{cases} \quad y = 2^{\text{nd}} \#$$

$$2x = 8$$

$$\boxed{x = 4}$$

$$4 + y = 12$$

$$\boxed{y = 8}$$

The two #'s are 4 & 8.

$$60. \begin{cases} x - y = -18 & (-1) \quad x = 1^{\text{st}} \# \\ 2x - y = -23 \end{cases} \quad y = 2^{\text{nd}} \#$$

$$\boxed{x = -5}$$

$$-5 - y = -18$$

$$-y = -13$$

$$\boxed{y = 13}$$

The two #'s are -5 & 13.

b1. $x = \#$ of nickels
 $y = \#$ of dimes

$$\begin{cases} x + y = 65 & y = -x + 65 \\ 0.05x + 0.1y = 5.30 \end{cases}$$

$$0.05x + 0.1(-x + 65) = 5.30$$

$$0.05x + (-0.1x + 6.5) = 5.30$$

$$-0.05x + 6.5 = 5.3$$

$$-0.05x = -1.2$$

$$\boxed{x = 24}$$

$$24 + y = 65$$

$$\boxed{y = 41}$$

Emma has 24 nickels
and 41 dimes.

b2. $x = \#$ of 49¢ stamps
 $y = \#$ of 34¢ stamps

$$\begin{cases} x + y = 26 & y = -x + 26 \\ 0.49x + 0.34y = 11.39 \end{cases}$$

$$0.49(x) + 0.34(-x + 26) = 11.39$$

$$0.49x - 0.34x + 8.84 = 11.39$$

$$0.15x = 2.55$$

$$\boxed{x = 17}$$

$$17 + y = 26$$

$$\boxed{y = 9}$$

Sarah and Owen purchased
17 49¢ stamps and
9 34¢ stamps.