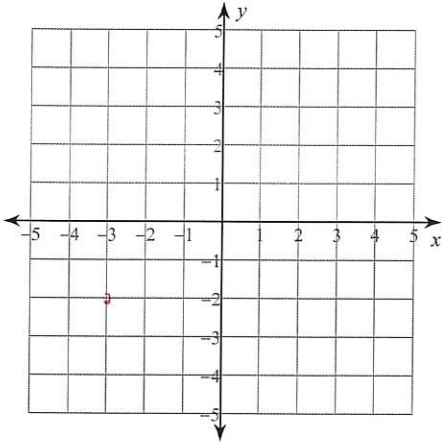


Semester 1 Exam Review

Solve each system by graphing.

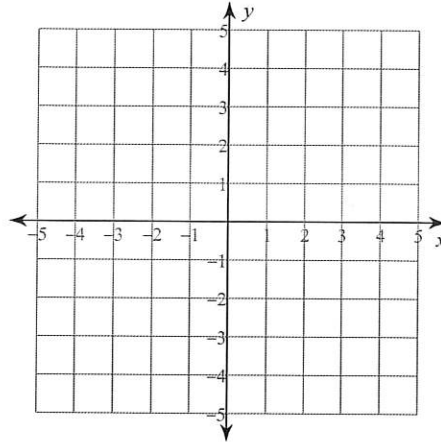
1) $y = -\frac{2}{3}x - 4$

$y = \frac{5}{3}x + 3$

 $(-3, -2)$ 

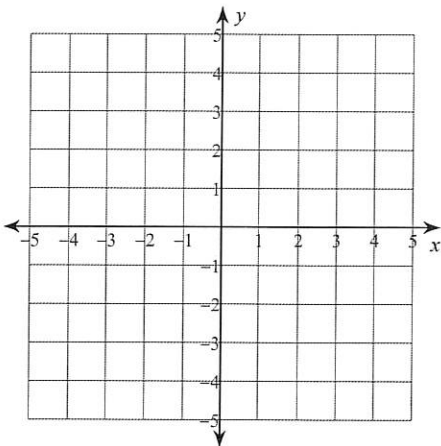
2) $y = 2x - 2$

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



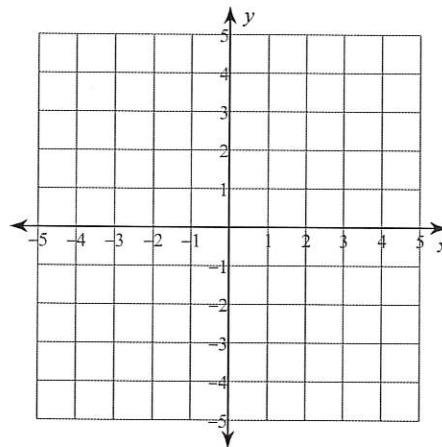
3) $x + 2y = -6$

$3x + 2y = -2$

 $(2, -4)$

4) $5x + 4y = -16$

$3x - 4y = -16$



Solve each system by substitution.

$$\begin{aligned} 5) \quad & -6x + 4y = -14 \\ & y = -4x - 9 \end{aligned}$$

$$(-1, -5)$$

$$\begin{aligned} 6) \quad & y = -6x + 2 \\ & 5x + 6y = -19 \end{aligned}$$

$$\begin{aligned} 7) \quad & 7x + 3y = 12 \\ & x + y = 0 \end{aligned}$$

$$(3, -3)$$

$$\begin{aligned} 8) \quad & x + 4y = -17 \\ & -5x + 6y = -19 \end{aligned}$$

Solve each system by elimination.

$$\begin{aligned} 9) \quad & 3x + 4y = 18 \\ & -x - 4y = -22 \end{aligned}$$

$$(-2, 6)$$

$$\begin{aligned} 10) \quad & 5 - 4x = y \\ & -2y + 16x = -10 \end{aligned}$$

$$\begin{aligned} 11) \quad & -7x + 7y = 7 \\ & -7x - 3y = -13 \end{aligned}$$

$$(1, 2)$$

$$\begin{aligned} 12) \quad & 2x + 3y = -9 \\ & 4x + 7y = -15 \end{aligned}$$

$$\begin{aligned} 13) \quad & -8x + 6y = 12 \\ & 3x - y = 8 \end{aligned}$$

$$(6, 10)$$

$$\begin{aligned} 14) \quad & -48x + 24y = 28 \\ & 42x - 21y = -21 \end{aligned}$$

$$\begin{aligned} 15) \quad & 7x = -49y - 14 \\ & -10 - 35y - 5x = 0 \end{aligned}$$

Infinitely many
solutions

Solve each system using matrices. Remember to have everything lined up correctly.

$$\begin{aligned} 16) \quad r - 2s + 3t &= 17 \\ -3r + 4s - t &= -5 \\ r - 3t &= -19 \end{aligned}$$

$$\begin{aligned} 17) \quad 5a - 2b + 2c &= 9 \\ 5a + 5b - 2c &= 10 \\ 4a + b + 4c &= 27 \end{aligned}$$

$$\begin{aligned} 18) \quad -x + 2y &= -8 \\ -x - y + z &= -6 \\ -x - 4z &= -2 \end{aligned}$$

$$\begin{aligned} 19) \quad -6x - 6y &= 12 \\ x - 2y + 3z &= -11 \\ 3x + 3z &= -15 \end{aligned}$$

- 20) Shayna's school is selling tickets to a choral performance. On the first day of ticket sales the school sold 4 adult tickets and 1 student ticket for a total of \$68. The school took in \$192 on the second day by selling 8 adult tickets and 9 student tickets. What is the price each of one adult ticket and one student ticket?

- 21) Bill and Kali are selling wrapping paper for a school fundraiser. Customers can buy rolls of plain wrapping paper and rolls of shiny wrapping paper. Bill sold 7 rolls of plain wrapping paper and 2 rolls of shiny wrapping paper for a total of \$47. Kali sold 3 rolls of plain wrapping paper and 11 rolls of shiny wrapping paper for a total of \$81. What is the cost each of one roll of plain wrapping paper and one roll of shiny wrapping paper?

plain paper \$5/roll
shiny paper \$6/roll

- 22) Jennifer and Lea each improved their yards by planting daylilies and shrubs. They bought their supplies from the same store. Jennifer spent \$12 on 2 daylilies and 2 shrubs. Lea spent \$54 on 3 daylilies and 12 shrubs. What is the cost of one daylily and the cost of one shrub?

- 23) Lisa and Shayna each improved their yards by planting daylilies and shrubs. They bought their supplies from the same store. Lisa spent \$74 on 7 daylilies and 6 shrubs. Shayna spent \$114 on 12 daylilies and 9 shrubs. Find the cost of one daylily and the cost of one shrub.

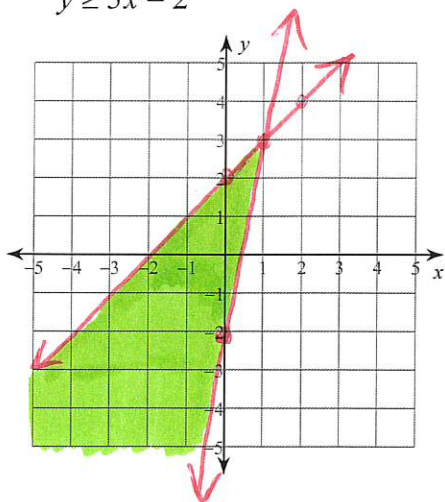
daylily \$2
shrub \$10

- 24) The sum of the digits of a certain two-digit number is 11. When you reverse its digits you decrease the number by 9. Find the number.

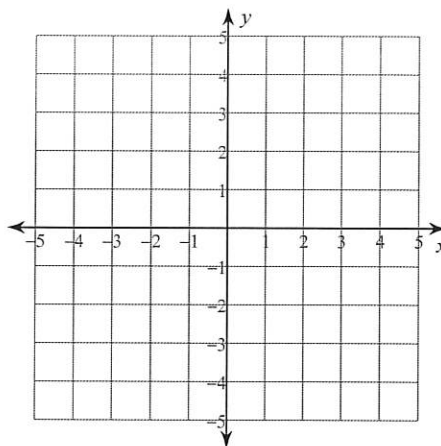
BONUS

Sketch the solution to each system of inequalities.

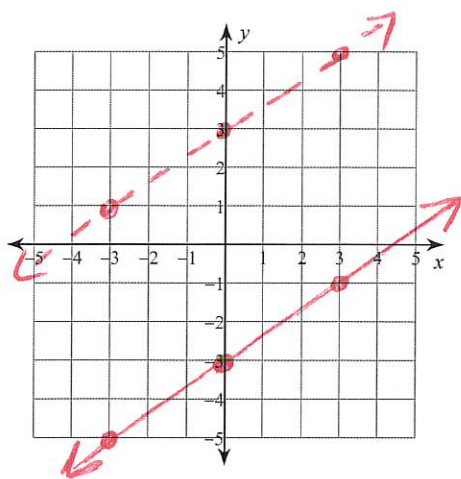
25) $y \leq x + 2$
 $y \geq 5x - 2$



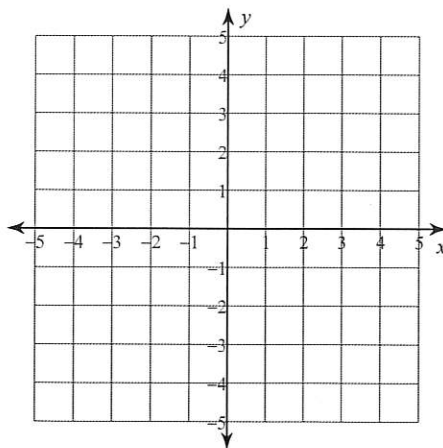
26) $y \leq \frac{1}{2}x + 2$
 $y > 3x - 3$



27) $y \leq \frac{2}{3}x - 3$
 $y > \frac{2}{3}x + 3$



28) $y < -x - 3$
 $y > x + 1$



Simplify.

29) $(-2 - 4i) + (-2 - 8i)$

$$-4 - 12i$$

30) $3 - 6 - (7 - 7i)$

31) $(-1 - i) + (4 - 5i) + (-8 - 4i)$

$$-5 - 10i$$

32) $(-4 + 2i) + (1 - 8i) - 7$

33) $(-3i)(-2 - i)$

$$-3 + 6i$$

34) $(-5i)(7 - 7i)$

35) $(3i)(-3i)(-8 + 6i)$

$$-72 + 54i$$

36) $(-7 - 8i)(4 - 5i)$

Factor each completely.

37) $42r^2 + 132r - 144$

$$6(7r - 6)(r + 4)$$

38) $9r^2 + 42r - 240$

39) $r^2 + r$

$$r(r + 1)$$

40) $n^2 + 7n + 10$

41) $r^4 - 2r^3 - 80r^2$

$$r^2(r + 8)(r - 10)$$

42) $6m^3 - 12m^2$

43) $30a^2 - 111a + 63$

$$3(a - 3)(10a + 7)$$

44) $4p^2 + 31p - 90$

45) $20m^2 + 54m + 36$

$$2(2m+3)(5m+6)$$

46) $18x^3 + 12x^2 - 70x$

47) $25p^2 - 9$

$$(5p+3)(5p-3)$$

48) $x^2 - 4$

49) $a^2 - 9b^2$

$$(a+3b)(a-3b)$$

50) $4r^2 - 20r + 25$

51) $3m^2 - 24m + 48$

$$3(m-4)^2$$

52) $16x^2 - 16xy + 4y^2$

Solve each equation by factoring.

53) $(7b + 4)(7b + 3) = 0$

$$\left\{-\frac{4}{7}, -\frac{3}{7}\right\}$$

54) $(v + 5)(v - 4) = 0$

55) $n^2 - 12n + 36 = 0$

$$\{6\}$$

56) $x^2 + 2x - 3 = 0$

57) $5k^2 + 33k - 56 = 0$

$$\left\{\frac{7}{5}, -8\right\}$$

58) $4a^2 - 15a - 25 = 0$

59) $x^2 + 2x - 1 = 2$

$$\{-3, 1\}$$

60) $p^2 - 10p + 20 = 4$

61) $2n^2 + 7n + 8 = 2$

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

62) $7m^2 + 33m - 14 = -4$

Solve each equation by taking square roots.

63) $x^2 = 49$

$$\{-7, 7\}$$

64) $r^2 = 95$

65) $n^2 - 10 = 66$

$$\{2\sqrt{19}, -2\sqrt{19}\}$$

66) $b^2 + 7 = 71$

67) $9v^2 + 3 = -155$

$$\left\{\frac{i\sqrt{158}}{3}, -\frac{i\sqrt{158}}{3}\right\}$$

68) $8x^2 + 6 = 398$

Solve each equation by completing the square.

69) $a^2 + 14a - 53 = 0$

$$\{-7 + \sqrt{102}, -7 - \sqrt{102}\}$$

70) $n^2 + 20n + 9 = 0$

71) $v^2 - 10v + 12 = 3$

$$\{9, 1\}$$

72) $x^2 - 18x - 50 = -10$

Solve each equation with the quadratic formula.

73) $p^2 + 12p + 32 = 0$

$$\{-4, -8\}$$

74) $2k^2 - 12k + 1 = 0$

75) $-2n^2 - 7 = -9$

$$\{-1, 1\}$$

76) $6x^2 + 7x - 22 = -7$