Applied Algebra 2 Semester One Final Review

CHAPTER 1

Solve each equation.

1. $-a + 2(-7 - 7a) = -134$

$$-a - 14 - 14a = -134$$
$$-15a = -120$$
$$\boxed{a = 8}$$

3. $-8\left|\frac{n}{6}\right| - 3 = -11$

$$-8\left|\frac{n}{6}\right| = -8$$
$$\left|\frac{n}{6}\right| = 1$$
$$\frac{n}{6} = 1 \quad \text{or} \quad \frac{n}{6} = -1$$
$$\boxed{n = 6 \text{ or } n = -6}$$

2. $8(x - 8) = -112$

$$8x - 64 = -112$$
$$8x = -48$$
$$\boxed{x = -6}$$

4. $4 + 5|-4n| = 24$
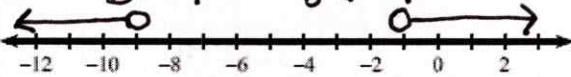
$$5|-4n| = 20$$
$$|-4n| = 4$$
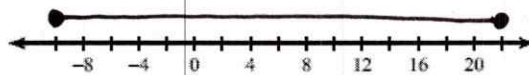$$-4n = 4 \quad \text{or} \quad -4n = -4$$
$$\boxed{n = -1 \quad \text{or} \quad n = 1}$$

Solve each inequality and graph the solution.

5. $8|b + 5| - 5 > 27$
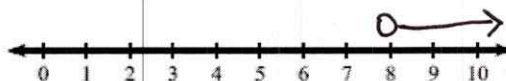
$$8|b + 5| > 32$$
$$|b + 5| > 4$$
$$b + 5 > 4 \quad \text{or} \quad b + 5 < -4$$
$$b > -1 \qquad b < -9$$

7. $3 + 2|k - 6| \le 33$

$$2|k - 6| \le 30$$
$$|k - 6| \le 15$$
$$k - 6 \le 15 \quad \text{or} \quad k - 6 \ge -15$$
$$k \le 21 \quad \text{or} \quad k \ge -9$$

6. $2 + 5(1 - 7x) \le 112$

$$5(1 - 7x) \le 110$$
$$1 - 7x \le 22$$
$$-7x \le 21$$
$$x \ge -3$$
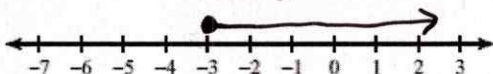
8. $-3(5 - 7x) > 153$

$$5 - 7x < -51$$
$$-7x < -56$$
$$x > 8$$

1

Simplify. Your answer should contain only positive exponents.

9. $x^4y^2x^{-3}y^5$

$$\boxed{xy^7}$$

11. $\dfrac{yx^{-2}\cdot 2x^4y^4}{(y^0)^{-2}}$ $\boxed{2y^5x^2}$

10. $\dfrac{x^{-2}}{(y^5x^{-3})^0}$ $\boxed{\dfrac{1}{x^2}}$

12. $\dfrac{(2x^4)^2\cdot 2x^2}{2x^2y^{-1}}$ $\dfrac{4x^8\,2x^2}{2x^2y^{-1}}$

$$\boxed{4x^8y}$$

Solve each equation and remember to check for extraneous solutions.

13. $(a+14)^{\frac{3}{2}}=64$

$(2+14)^{\frac{3}{2}}=64$

$a+14=16$ $64=64\checkmark$

$\boxed{a=2}$

16. $\sqrt{x-8}=\sqrt{25-2x}$

$x-8=25-2x$ $\sqrt{11-8}=\sqrt{25-2(11)}$

$3x=33$ $\sqrt{3}=\sqrt{3}\checkmark$

$\boxed{x=11}$

14. $-5\cdot(64r)^{\frac{5}{6}}=-160$

$(64r)^{5/6}=32$ $-5\cdot(64(1))^{\frac{5}{6}}=-160$

$64r=64$ $-5(32)=-160$

$\boxed{r=1}$ $-160=-160\checkmark$

17. $\sqrt{2x+21}=\sqrt{-3-2x}$

$2x+21=-3-2x$ $\sqrt{2(-6)+21}=\sqrt{-3-2(-6)}$

$4x=-24$ $\sqrt{-12+21}=\sqrt{-3+12}$

$\boxed{x=-6}$ $\sqrt{9}=\sqrt{9}\checkmark$

15. $\sqrt{3n-27}=\sqrt{n-3}$

$3n-27=n-3$ $\sqrt{3(12)-27}=\sqrt{12-3}$

$2n=24$ $\sqrt{36-27}=\sqrt{9}$

$\boxed{n=12}$ $\sqrt{9}=\sqrt{9}\checkmark$

18. $\sqrt{x-8}=\sqrt{20-x}$

$x-8=20-x$ $\sqrt{14-8}=\sqrt{20-14}$

$2x=28$ $\sqrt{6}=\sqrt{6}\checkmark$

$\boxed{x=14}$

Simplify

19. $(-4 + i) + (+6 + 6i)$

$\boxed{2 + 7i}$

22. $(6 + 8i) - (z + 3i)$

$\boxed{6 - z + 5i}$

20. $(-8 - 3i)^2$

$(-8 - 3i)(-8 - 3i)$

$64 + 48i + 9i^2$

$64 + 48i - 9$

$\boxed{55 + 48i}$

23. $(5 - 5i)^2$

$(5 - 5i)(5 - 5i)$

$25 - 25i - 25i + 25i^2$

$25 - 50i - 25$

$\boxed{-50i}$

21. $(4 - 4i)(-7 - 5i)$

$-28 - 20i + 28i + 20i^2$

$-28 + 8i - 21$

$\boxed{-49 + 8i}$

24. $(-8 + 6i)^2$

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

$64 - 48i - 48i + 36i^2$

$64 - 96i - 36$

$\boxed{28 - 96i}$

CHAPTER 3

Identify the parent function and transformations.

25. $y = -(x - 2)^3 + 1$

Parent Function: Cube, x^3

Transformations:

Reflect x-axis
right 2 units
up 1 unit

26. $y = \frac{1}{4}|x + 5| - 9$

Parent Function: absolute value $|x|$

Transformations:

vertical stretch $\frac{1}{4}$
5 units right
down 9 units

27. $y = \sqrt{x - 3} + 2)$

Parent Function: Square root $\sqrt{}$

Transformations:

3 units right
2 units up

Write the new rule given the equation and transformations.

28. $y = |x + 1| - 3$ translated 6 units right, down 4 units, and vertically stretched by 5

-6 -4

$y = 5|x - 5| - 7$

29. $y = +|x - 4| + 6$ translated 4 units left and reflected across the x-axis

$+4$

$y = |x| + 6$

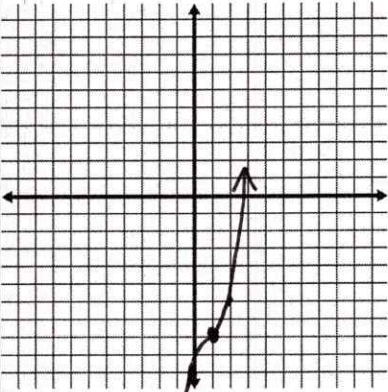30. $y = (x - 5)^2 - 7$ translated down 6 units, right 4 units, and reflected across the x-axis

-4 -6

$y = -(x - 9)^2 - 13$

3

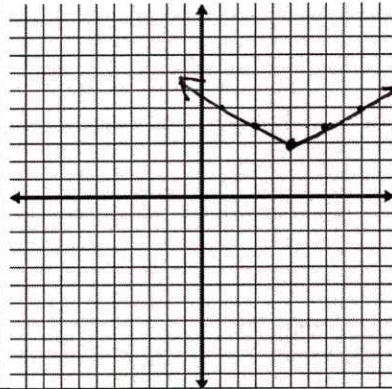State the transformations and graph the equation.

31. $y = 2(x-1)^3 - 8$	32. $y = \frac{1}{2}|x-5| + 3$
Transformations:	Transformations:
Vertical stretch by 2	Vertical stretch ½
Right 1 unit	Right 5 units
8 units down	Up 3 units

33. $y = -(x+1)^2 - 4$	34. $y = -2\sqrt{x} + 6$
Transformations:	Transformations:
reflect x-axis	reflect x-axis
left 1 unit	stretch by 2
4 units down	up 6 units
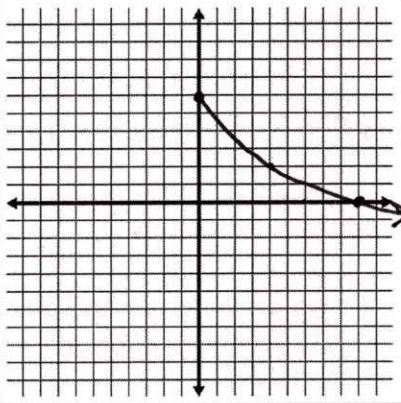
Evaluate each function.

35. $f(t) = 4t - 4$; Find $f(3)$

$$f(3) = 4(3) - 4$$
$$= 12 - 4$$
$$\boxed{f(3) = 8}$$

36. $f(x) = 4x + 4$; Find $f(-5)$

$$f(-5) = 4(-5) + 4$$
$$= -20 + 4$$
$$\boxed{f(-5) = -16}$$

37. $p(t) = -t^2 - 2$; Find $p(8)$

$$p(8) = -8^2 - 2$$
$$= -64 - 2$$
$$\boxed{p(8) = -66}$$

38. $g(x) = |-x|$; Find $g(3)$

$$g(3) = |-3|$$
$$\boxed{g(3) = 3}$$

4

Find the inverse of each function.

39. $g(x) = \frac{3x-9}{2}$

$y = \frac{3x-9}{2}$

$x = \frac{2y+9}{3}$

$2y = 3x-9$

$2y+9 = 3x$

$$g^{-1}(x) = \frac{2x+9}{3}$$

40. $h(x) = \frac{3}{x-2}$

$(x-2)(y) = 3$

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

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

$$h^{-1}(x) = \frac{3}{x}+2$$

41. $f(x) = -\frac{4}{x} + 1$

$y = -\frac{4}{x} + 1$

$x = \frac{-4}{y-1}$

$y-1 = -\frac{4}{x}$

$x(y-1) = -4$

$$f^{-1}(x) = \frac{-4}{x-1}$$

42. $h(x) = -\frac{1}{5}x + \frac{1}{5}$

$5y = -x+1$

$5y-1 = -x$

$-5y+1 = x$

$$h^{-1}(x) = -5x+1$$

Perform the indicated operation.

43. $g(t) = t^3 - 2$ and $h(t) = 3t$ find $(g-h)(t)$

$t^3 - 2 - 3t$

$$(g-h)(t) = t^3 - 3t - 2$$

44. $g(n) = n^3 - 2n$ and $f(n) = 2n + 1$
find $(g-f)(n)$

$n^3 - 2n - (2n+1)$

$$(g-f)(n) = n^3 - 4n + 1$$

45. $g(n) = n^2 - 4$ and $f(n) = 3n + 2$
find $(g \circ f)(n)$

$(3n+2)^2 - 4$

$9n^2 + 6n + 6n + 4 - 4$

$$(g \circ f)(n) = 9n^2 + 12n$$

46. $g(x) = 3x$ and $h(x) = x^3 + x^2$ find $(g \circ h)(x)$

$3(x^3 + x^2)$

$$(g \circ h)(x) = 3x^3 + 3x^2$$

47. $h(x) = -4x + 2$ and $g(x) = -2x + 5$
find $(h \circ g)(x)$

$-4(-2x+5) + 2$

$(h \circ g)(x) = 8x - 20 + 2$

$$(h \circ g)(x) = 8x - 18$$

48. $f(n) = 4n + 5$ and $g(n) = n^2 - 2n$
find $(f \circ g)(n)$

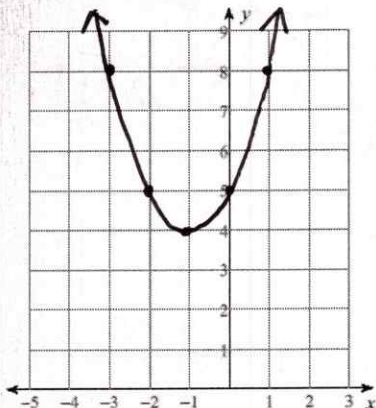$4(n^2 - 2n) + 5$

$$(f \circ g)(n) = 4n^2 - 8n + 5$$
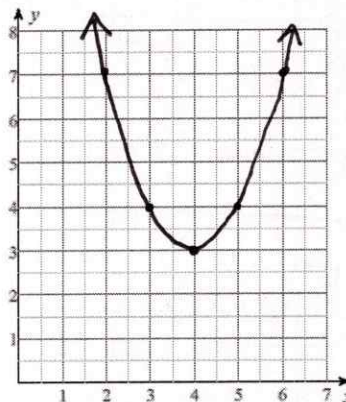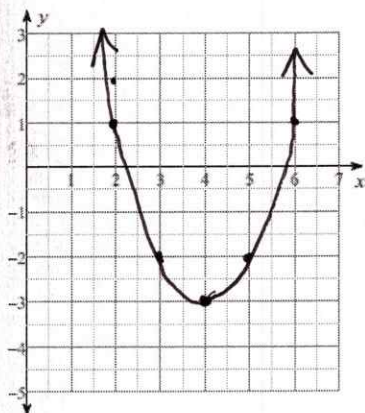
5

Sketch the graph of each function
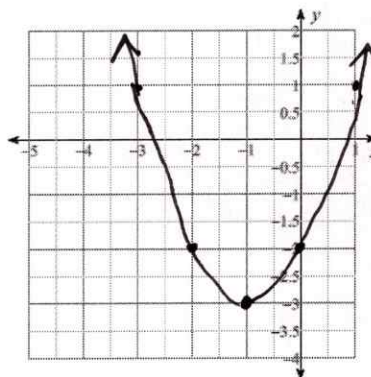
49. $y = x^2 + 2x + 5$

51. $y = x^2 - 8x + 19$

50. $y = x^2 - 8x + 13$

52. $y = x^2 + 2x - 2$

Solve each equation by taking the square root.

53. $6p^2 + 9 = 69$

$$6p^2 = 60$$
$$\sqrt{p^2} = \sqrt{10}$$
$$\boxed{p = \pm 3.16}$$

55. $7x^2 - 9 = 61$

$$7x^2 = 70$$
$$\sqrt{x^2} = \sqrt{10}$$
$$\boxed{x = \pm 3.16}$$

54. $36r^2 - 2 = 2$

$$36r^2 = 4$$
$$\sqrt{r^2} = \sqrt{\frac{4}{36}}$$
$$r = \pm \frac{2}{6}$$
$$\boxed{r = \pm \frac{1}{3}}$$

56. $8n^2 + 2 = 290$

$$8n^2 = 288$$
$$\sqrt{n^2} = \sqrt{36}$$
$$\boxed{n = \pm 6}$$

6

Solve each equation by factoring.

57. $p^2 - 2p = 3$

$$p^2 - 2p - 3 = 0$$
$$(p - 3)(p + 1) = 0$$
$$\boxed{p = 3 \text{ } \& \text{ } p = -1}$$

59. $n^2 + 7 = -8n$

$$n^2 + 8n + 7 = 0$$
$$(n + 7)(n + 1) = 0$$
$$\boxed{n = -7 \text{ and } n = -1}$$

58. $m^2 - 21 = -4m$

$$m^2 + 4m - 21 = 0$$
$$(m + 7)(m + 3) = 0$$
$$\boxed{m = -7 \text{ and } m = -3}$$

60. $a^2 - a = -6$

$$a^2 - a + 6 = 0$$
$$\cancel{(a - 3)}$$
$$\boxed{\text{Not factorable}}$$

Solve each equation by completing the square.

61. $r^2 - 10r - 86 = 10$ $\left(\frac{b}{2}\right)^2 = \left(\frac{-10}{2}\right)^2 = \underline{25}$

$$r^2 - 10r + \underline{25} = 96 + \underline{25}$$
$$(r - 5)^2 = 121$$
$$r - 5 = \pm 11$$
$$r - 5 = 11 \quad \text{or} \quad r - 5 = -11$$
$$\boxed{r = 16 \quad \text{or} \quad r = -6}$$

62. $r^2 + 18r - 67 = -4$ $\left(\frac{18}{2}\right)^2 = 81$

$$r^2 + 18r + \underline{81} = 63 + 81$$
$$(r + 9)^2 = 144$$
$$r + 9 = 12 \quad \text{or} \quad r + 9 = -12$$
$$\boxed{r = 3 \quad \text{or} \quad r = -21}$$

63. $n^2 + 14n - 41 = -9$ $\left(\frac{14}{2}\right)^2 = \underline{49}$

$$n^2 + 14n + \underline{49} = 32 + \underline{49}$$
$$(n + 7)^2 = 81$$
$$n + 7 = \pm 9$$
$$n + 7 = 9 \quad \text{or} \quad n + 7 = -9$$
$$\boxed{n = 2 \quad \text{or} \quad n = -16}$$

64. $x^2 + 6x - 63 = 4$ $\left(\frac{6}{2}\right)^2 = 9$

$$x^2 + 6x + \underline{9} = 67 + 9$$
$$(x + 3)^2 = 76$$
$$x + 3 = \pm\sqrt{76} \quad \text{or} \quad x + 3 = -\sqrt{76}$$
$$\boxed{x = -3 + \sqrt{76} \quad \text{or} \quad x = -3 - \sqrt{76}}$$

Solve each equation by using the quadratic formula.

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

65. $9x^2 - 4x = -7$

$$9x^2 - 4x + 7 = 0$$

$\overset{\uparrow}{a} \quad \overset{\uparrow}{b} \quad \overset{\uparrow}{c}$

$$X = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(9)(7)}}{2(9)}$$

$$= \frac{4 \pm \sqrt{-236}}{18}$$

$$\boxed{\text{No Solution}}$$

67. $5x^2 - 7 = -6x$

$$5x^2 + 6x - 7 = 0$$

$$X = \frac{-6 \pm \sqrt{6^2 - 4(5)(-7)}}{2(5)}$$

$$\boxed{X = \frac{-6 \pm \sqrt{176}}{10}}$$

$$=$$

66. $6a^2 + a = -2$

$$6a^2 + a + 2 = 0$$

$$X = \frac{-1 \pm \sqrt{1^2 - 4(6)(2)}}{2(6)}$$

$$= \frac{-1 \pm \sqrt{-47}}{12}$$

$$\boxed{\text{No Solution}}$$

68. $6n^2 + 5n = 14$

$$6n^2 + 5n - 14 = 0$$

$$X = \frac{-5 \pm \sqrt{5^2 - 4(6)(-14)}}{2(6)}$$

$$= \frac{-5 \pm \sqrt{361}}{12}$$

$$= \frac{-5 \pm 19}{12}$$

$$\frac{-5 + 19}{12} \qquad \frac{-5 - 19}{12}$$

$$\frac{14}{12} \qquad \frac{-24}{12}$$

$$\boxed{x = 1.17 \text{ and } x = -2}$$

Simplify each expression.

69. $(8 + 4n^2 + n^4) + (8 + 8n^4 + 5n^2)$

$$\boxed{16 + 9n^4 + 9n^2}$$

71. $(8v - 7v^2 + 8) - (6 - 8v^2 - 2v)$

$$\boxed{2 + v^2 + 10v}$$

70. $(7p^3 + 8p^2 - 2) + (3 - 6p^3 - 5p^2)$

$$\boxed{p^3 + 3p^2 + 1}$$

72. $(4 - 2p^3 - 2p^2) + (8p^2 + 5p^3 - 5p^4)$

$$\boxed{-5p^4 + 3p^3 - 10p^2 + 4}$$

State if the given binomial is a factor of the given polynomial.

73. $(m^3 + 13m^2 + 32m - 6) \div (m + 4)$

$$-4 \begin{array}{|rrrr} 1 & 13 & 32 & -6 \\ \downarrow & -4 & -32 & 0 \\ \hline 1 & 9 & 0 & -6 \end{array}$$

$$\boxed{\text{No}}$$

75. $(r^3 - 3r^2 - 18r - 70) \div (r - 7)$

$$7 \begin{array}{|rrrr} 1 & -3 & -18 & -70 \\ \downarrow & 7 & 28 & 70 \\ \hline 1 & 4 & 10 & 0 \end{array}$$

$$\boxed{\text{yes}}$$

74. $(m^3 + 8m^2 + 5m - 19) \div (m + 2)$

$$-2 \begin{array}{|rrrr} 1 & 8 & 5 & -19 \\ \downarrow & -2 & -12 & 14 \\ \hline 1 & 6 & -7 & -5 \end{array}$$

$$\boxed{\text{No}}$$

76. $(m^3 + 3m^2 - 37m - 15) \div (m - 5)$

$$5 \begin{array}{|rrrr} 1 & 3 & -37 & -15 \\ \downarrow & 5 & 40 & 15 \\ \hline 1 & 8 & 3 & 0 \end{array}$$

$$\boxed{\text{yes}}$$

Describe the end behavior of each function.

77. $f(x) = -x^4 + x^2 + 4$

$x \to -\infty, f(x) \to -\infty$

$x \to \infty, f(x) \to -\infty$

79. $f(x) = -x^5 - 4x^3 + 2x + 2$

$x \to -\infty, f(x) \to +\infty$

$x \to \infty, f(x) \to -\infty$

78. $f(x) = x^3 + x^2 - x + 2$

$x \to -\infty, f(x) \to -\infty$

$x \to \infty, f(x) \to \infty$

80. $f(x) = -x^2 + 3$

$x \to -\infty, f(x) \to -\infty$

$x \to +\infty, f(x) \to -\infty$

State the maximum number of turns the graph for each function could make.

81. $f(x) = -x^5 + 3x^3 - 3x + 1$

4

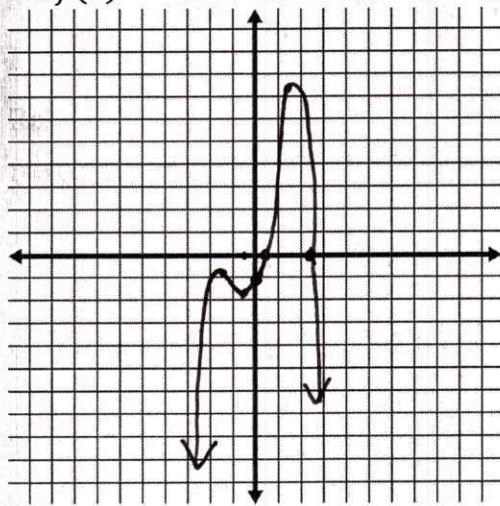83. $f(x) = -x^2 + 2x + 2$

1

82. $f(x) = x^5 - 2x^3 + x - 2$

4

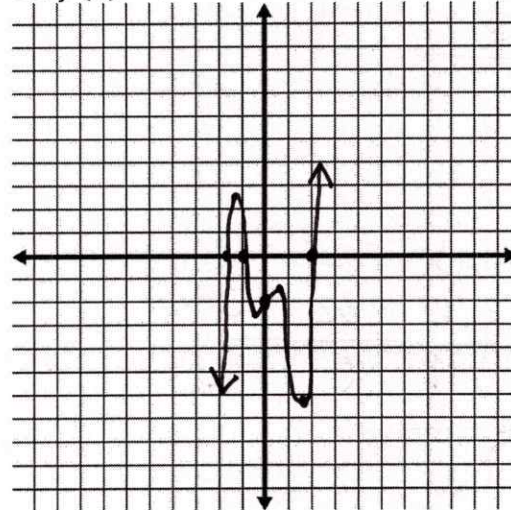84. $f(x) = x^4 - x^3 - x^2 - 1$

3

Sketch a graph of each function and then state the zeros, multiplicity, y-intercept, maximum number of turns, and describe the end behavior.

85. $f(x) = -x^4 + 4x^2 + 3x - 1$

Zeros: $(0.25, 0)$ and $(2.27, 0)$

y-intercept: $(0, -1)$

Max # of turns: 3

End behavior: $x \to -\infty, f(x) \to -\infty$
$x \to \infty, f(x) \to -\infty$

Relative min: $(-0.4, -1.6)$

Relative max:
$(-1.2, -0.9)$
$(1.6, 7.5)$

86. $f(x) = x^5 - 4x^3 + x - 2$

Zeros: $(-1.8, 0)$ $(-1, 0)$ $(2, 0)$

y-intercept: $(0, -2)$

Max # of turns: 4

End behavior: $x \to -\infty, f(x) \to -\infty$
$x \to \infty, f(x) \to \infty$

Relative min: $(1.5, -6.4)$ $(-0.3, -2.2)$

Relative max: $(0.3, -1.8)$
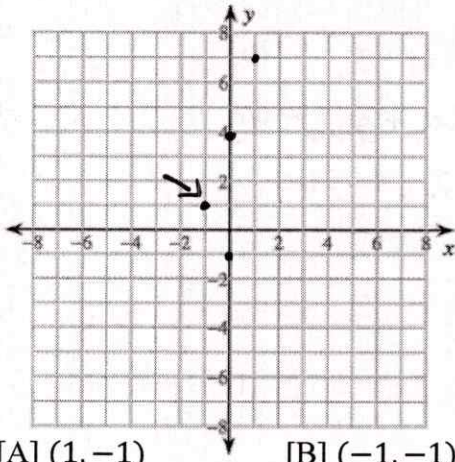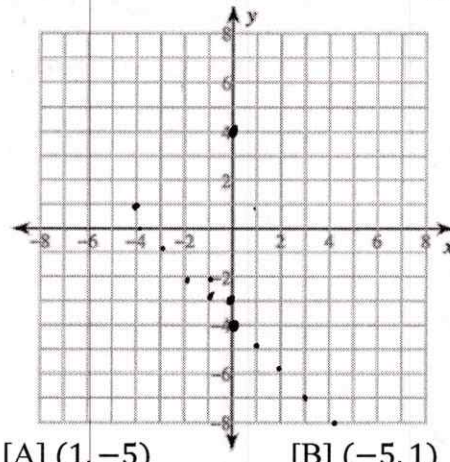$(-1.5, 2.4)$

10

Solve each system by graphing.

25. $y = 3x + 4$

$y = -2x - 1$

$-4y = -3x + 16$

$y = \frac{3}{4}x + 4$

26. $y = -x - 3$

$-4y + 16 = -3x$

[A] $(1, -1)$ [B] $(-1, -1)$

[C] $(-1, 1)$ [D] $(1, 1)$

[A] $(1, -5)$ [B] $(-5, 1)$

[C] $(1, -4)$ [D] $(-4, 1)$

Solve each system by elimination.

27. $3(2x - 6y = -22)$

$-6y = -2x - 22$

$y = \frac{1}{3}x + \frac{22}{6}$

$7x + 12y = 22$

$4x - 12y = -44$

$7x + 12y = 22$

$11x = -22$

$x = -2$

[A] Infinite Solutions   [B] $(3, -2)$ [C] $(-3, -2)$ [D] $(-2, 3)$

28. $10x - 4y = -10$

$-10x + 4y = 20$

[A] $(-4, 4)$ [B] No Solution   [C] $(-5, 4)$ [D] $(-4, -4)$

Solve each system by substitution.

29. $x + 7y = 14$

$3x + 5y = -6$

$3(-7y + 14) + 5y = -6$

$-21y + 42 + 5y = -6$

$-16y = -48$

[A] $(-3, 6)$ [B] $(-7, 3)$ $y = 3$ [C] $(3, -6)$ [D] $(3, 6)$

30. $2x - 2y = -24$

$-2x + y = 19$

$2x - 2(2x + 19) = -24$

$2x - 4x - 38 = -24$

$-2x = 14$

[A] $(-7, -5)$ [B] $(-7, 5)$ [C] $(1, -5)$ [D] No Solution

$x = -7$

31. Jessica and Kristin are selling pies for a school fundraiser. Customers can buy apple pies and pumpkin pies. Jessica sold 3 apple pies and 5 pumpkin pies for a total of $96. Kristin sold 5 apple pies and 1 pumpkin pie for a total of $72. Find the cost each of one apple pie and one pumpkin pie.

[A] apple pie: $12, pumpkin pie: $12

[B] apple pie: $9, pumpkin pie: $7

[C] apple pie: $14, pumpkin pie: $8

[D] apple pie: $14, pumpkin pie: $7

$$3a + 5p = 96$$
$$p = -5a + 72 \qquad 3a + 5(-5a + 72) = 96$$
$$3a - 25a + 360 = 96$$
$$-22a = -264$$
$$a = 12$$

Solve each system.

32. $y = -5x + 2z - 11$

$4x - 3y - z = -19$

$-5x - 5y - 5z = -15$

[A] $(-2, 3, 2)$

[B] $(2, -3, 0)$

[C] $(-4, -5, -1)$

[D] $(-4, 1, 3)$

33. $-6x - 4y = 4$

$x + 4y + 4z = 16$

$-6x + y + 6z = -29$
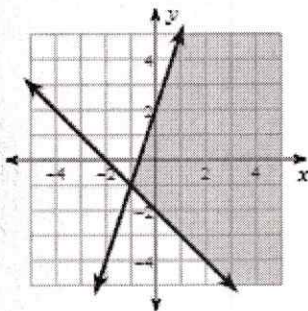
[A] No Solution

[B] $(-2, -1, 2)$

[C] $(-2, 0, 1)$

[D] $(1, 0, -2)$

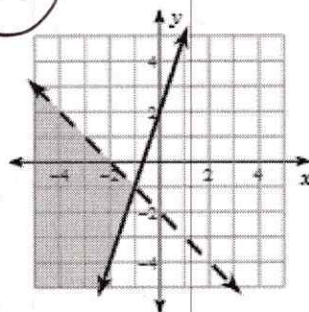**Sketch the solution to each system of inequalities.**
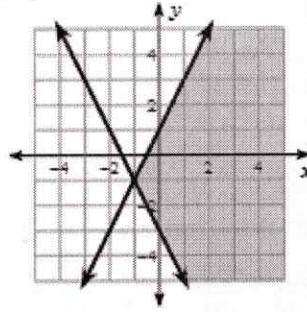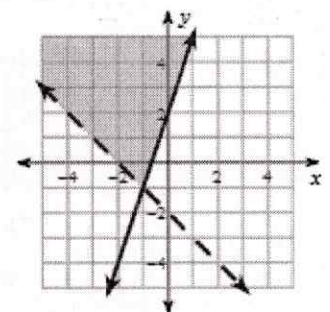
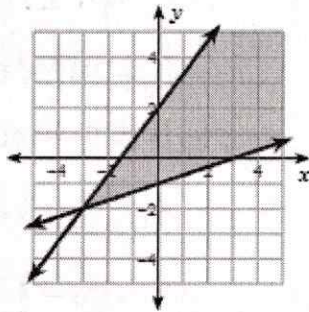**34.** $y < -x - 2$

$y \geq 3x + 2$

[A]

[B]

[C]

[D]

35. $y \leq \frac{1}{3}x - 1$

   $y \leq \frac{4}{3}x + 2$
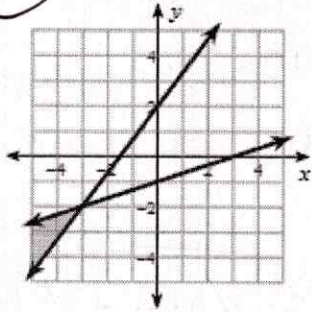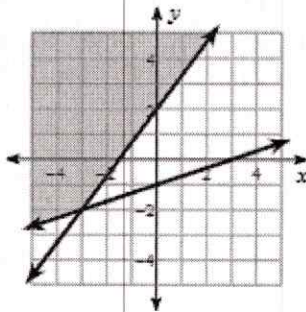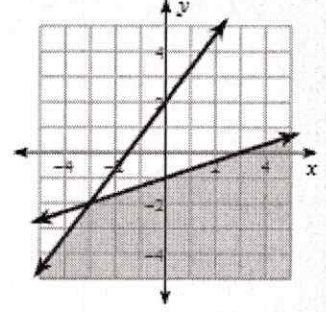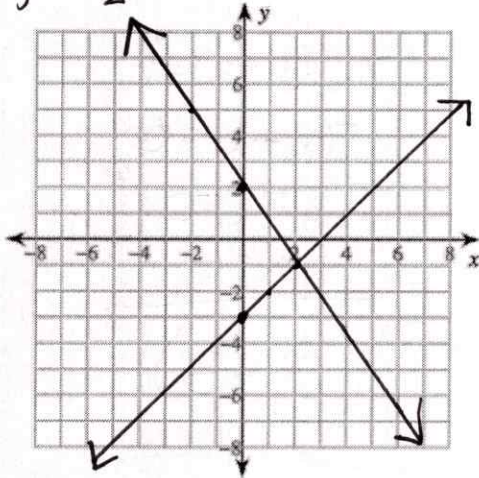
(A) [B] [C] [D]

Solve each system by graphing.

36. $3x + 2y = 4$ $\quad y = -\frac{3}{2}x + 2$

   $y - x + 3 = 0$

   $y = x - 3$

   $\boxed{(2, -1)}$

37. $-18 = -6y - 21x$ $\quad -6y = 21x - 18$ $\quad y = \frac{21}{6}x + 3$ $\quad y = -\frac{7}{2} + 3$

   $6 + 7x = -2y$

   $y = -\frac{7}{2}x - 3$

   $\boxed{\text{No Solution}}$
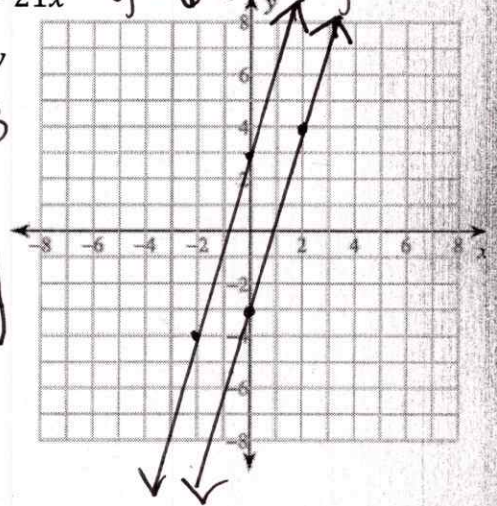
Solve each system by elimination.

38. $-x - 7y = -3$

   $+ \quad 3x + 7y = 9$

   $2x = 6$

   $x = 3$

   $-3 - 7y = -3$

   $-7y = 0 \quad y = 0$

   $\boxed{(3, 0)}$

39. $5x - 2y = 22$

   $+ \quad -5x + 2y = -22$

   $0 = 0$

   $\boxed{\text{Infinite Solutions}}$

40. $5x - 5y = 5$

   $-10x + 10y = -10$

   $-8x - 10y = -26$

   $-18x = -36$

   $x = 2$

   $5(2) - 5y = 5$

   $-5y = -5$

   $y = 1$

   $\boxed{(2, 1)}$

41. $10x - 6y = 0$

   $-6x + 6y = -24$

   $4x = -24$

   $x = -6$

   $-60 - 6y = 0$

   $-6y = 60$

   $y = -10$

   $\boxed{(-6, -10)}$

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Solve each system by substitution.

42. $y = 2x + 1$

$-5x - y = -1$

$-5x - 2x - 1 = -1$

$-7x = 0$

$x = 0$

$y = 1$

$\boxed{(0, 1)}$

43. $-2x - y = -12$

$y = 3x + 2$

$-2x - 3x - 2 = -12$

$-5x = -10$

$x = 2$

$y = 6 + 2$

$y = 8$

$\boxed{(2, 8)}$

Solve each system.

46. $6a + 3b - 6c = 0$

$-3a + 2b + 6c = 2$

$+ \ 3a - 4b - 6c = 2$

$-2b = 4$

$b = -2$

$6a + 3b - 6c = 0$

$-3a + 2b + 6c = 2$

$3a + 5b = 2$

$3a - 10 = 2$

$3a = 12$

$a = 4$

$3(4) - 4(-2) - 6c = 2$

$12 + 8 - 6c = 2$

$20 - 6c = 2$

$-6c = -18$

$c = 3$

$\boxed{(4, -2, 3)}$

44. $8x - 6y = 10$

$x - 4y = 24$

$x = 4y + 24$

$8(4y + 24) - 6y = 10$

$32y + 192 - 6y = 10$

$26y = -182$

$y = -7$

$x = -28 + 24$

$= -4$

$\boxed{(-4, -7)}$

45. $y = -3$

$7x - 2y = 6$

$7x - 2(-3) = 6$

$7x + 6 = 6$

$7x = 0$

$x = 0$

$\boxed{(0, -3)}$

47. $-5a = -5 \quad a = 1$

$a = -3b + 6c - 6$

$b = -2a + 2c + 13$

$1 = -3b + 6c - 6 \qquad b = -2 + 2c + 13$

$7 = -3b + 6c \qquad\qquad b = 2c + 11$

$7 = -3(2c + 11) + 6c$

$7 = -6c - 33 + 6c$

$40 = 0c$

$\boxed{\text{No Solution}}$

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