

**Pre-Calculus 11 - Review****(calculators, scrap and graph paper permitted)****Multiple Choice***Identify the choice that best completes the statement or answers the question.*

- \_\_\_\_\_ 1. Classify the number  $\sqrt{\frac{16}{4}}$ .
- I. Positive integer  
II. Rational number  
III. Irrational number  
IV. Real number
- a. I, II, and IV      b. III and IV      c. II and IV      d. I and II
- \_\_\_\_\_ 2. Which set of numbers contains all rational numbers?
- a.  $-5, \sqrt{10}, 0.858585\dots$       c.  $5, \frac{5}{10}, \sqrt{7}$   
b.  $0, \sqrt{25}, -1.\bar{6}$       d.  $-\sqrt{5}, -\sqrt{49}, -3.35$
- \_\_\_\_\_ 3. Write  $\frac{4}{9}$  as a square root.
- a.  $\sqrt[3]{\frac{64}{729}}$       b.  $\sqrt{\frac{16}{18}}$       c.  $\sqrt{\frac{8}{81}}$       d.  $\sqrt{\frac{16}{81}}$
- \_\_\_\_\_ 4. Simplify:  $3^{\frac{1}{2}} \cdot 3^{\frac{1}{2}}$
- a.  $\frac{1}{3^4}$       b. 3      c. 1      d.  $\sqrt{3}$
- \_\_\_\_\_ 5. Which power is equivalent to  $(\sqrt[7]{-125})^4$ ?
- a.  $-125^{\frac{4}{7}}$       b.  $(-125)^{\frac{7}{4}}$       c.  $(-125)^{\frac{4}{7}}$       d.  $-125^{\frac{7}{4}}$
- \_\_\_\_\_ 6. Which expression is equivalent to  $\left(\frac{50}{32}\right)^{-\frac{3}{2}}$ ?
- a.  $\left(\frac{25}{16}\right)^{\frac{3}{2}}$       b.  $\left(\frac{16}{25}\right)^{\frac{2}{3}}$       c.  $\sqrt{\left(\frac{16}{25}\right)^3}$       d.  $\sqrt[3]{\left(\frac{16}{25}\right)^2}$
- \_\_\_\_\_ 7. Write  $\frac{1}{25}$  as a power with a negative exponent.
- a.  $2^{-5}$       b.  $5^{-2}$       c.  $(-5)^2$       d.  $-5^{-2}$
- \_\_\_\_\_ 8. Simplify  $4x^{-6} \cdot 2x^3$ . Write the expression with positive exponents.
- a.  $\frac{x^3}{64}$       b.  $\frac{8}{x^3}$       c.  $\frac{64}{x^3}$       d.  $-\frac{x^3}{8}$

\_\_\_ 9. Evaluate  $\left(\frac{9^{\frac{5}{8}}}{9^{\frac{1}{8}} \cdot 9^{\frac{1}{4}}}\right)^8$ . Write the answer as an integer or a fraction in lowest terms.

- a.  $\frac{81}{5}$                       b.  $-\frac{1}{81}$                       c. 81                      d.  $\frac{1}{81}$

\_\_\_ 10. Simplify  $\left(\frac{5}{2}a^{-2}b^6\right)^{-3}$ . Write the expression with positive exponents.

- a.  $\frac{125a^6}{8b^{18}}$                       b.  $\frac{8b^3}{125a^5}$                       c.  $\frac{125b^{18}}{8a^6}$                       d.  $\frac{8a^6}{125b^{18}}$

\_\_\_ 11. Evaluate  $(a^{-6}b^{-3})^3(a^5b^6)^2$  for  $a = -1$  and  $b = 3$ .

- a. 27                      b. -27                      c.  $\frac{1}{27}$                       d.  $-\frac{1}{27}$

\_\_\_ 12. Write  $\sqrt{200}$  as a mixed radical.

- a.  $10\sqrt{2}$                       b.  $2\sqrt{50}$                       c.  $100\sqrt{2}$                       d.  $2\sqrt{10}$

\_\_\_ 13. Expand.  $(4x - 6)(2x - 5)$

- a.  $8x^2 - 32x + 30$                       c.  $8x^2 - 8x - 30$   
b.  $8x^2 + 32x + 30$                       d.  $8x^2 + 8x - 30$

\_\_\_ 14. Determine which trinomial is factorable.

- a.  $x^2 - 5x + 6$                       c.  $x^2 - 5x + 9$   
b.  $x^2 + 2x + 6$                       d.  $2x^2 + 5x + 6$

\_\_\_ 15. Determine which trinomial cannot be factored.

- a.  $2x^2 - 9x - 5$                       c.  $3x^2 + x - 2$   
b.  $3x^2 + x + 2$                       d.  $2x^2 - 4x - 5$

\_\_\_ 16. Factor the trinomial  $x^2 + 7x + 10$ .

- a.  $(x + 5)(x + 2)$                       c.  $(x + 5)(x - 2)$   
b.  $(x - 5)(x - 2)$                       d.  $(x - 5)(x + 2)$

\_\_\_ 17. Factor the trinomial  $2x^2 + 3x - 9$ .

- a.  $(2x + 3)(x + 3)$                       c.  $(2x + 3)(x - 3)$   
b.  $(2x - 3)(x + 3)$                       d.  $(2x - 3)(x - 3)$

\_\_\_ 18. Factor the trinomial  $60x^2 - 27x - 54$ .

- a.  $(5x - 6)(12x + 9)$                       c.  $(5x - 6)(4x + 3)$   
b.  $3(5x - 6)(4x + 3)$                       d.  $3(5x + 6)(4x + 3)$

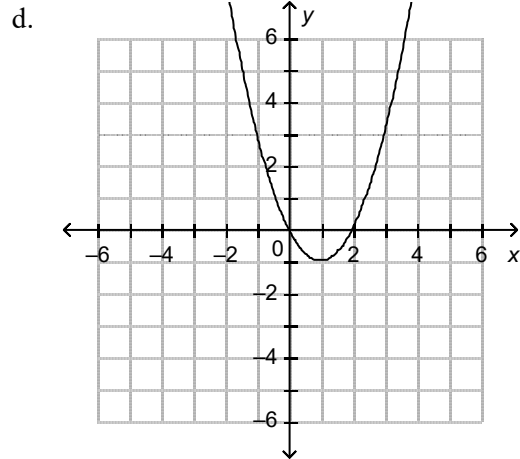
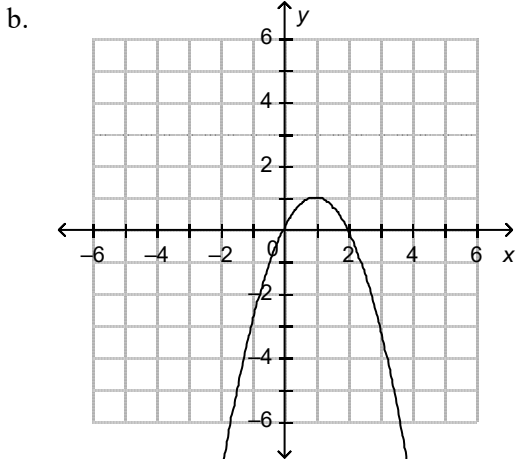
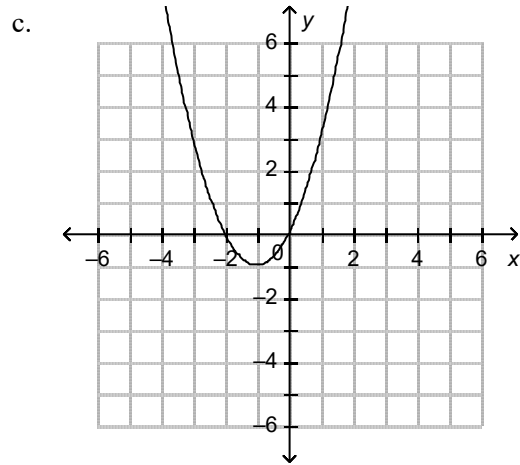
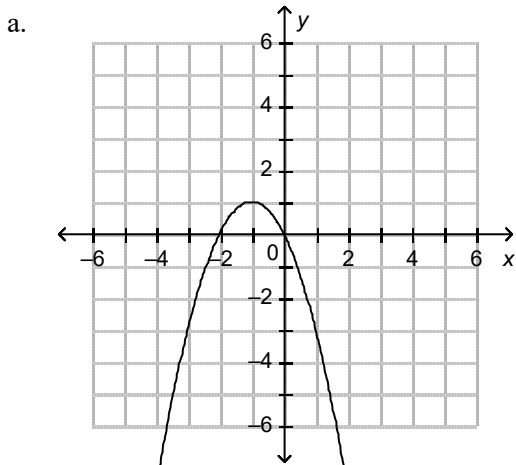
\_\_\_ 19. Factor the trinomial  $-3x^2 - 6x + 72$ .

- a.  $6(x - 3)(x - 4)$                       c.  $-3(x + 6)(x + 4)$   
b.  $-4(x + 6)(x - 3)$                       d.  $-3(x - 4)(x + 6)$

\_\_\_ 20. Factor:  $49b^2 - 64$

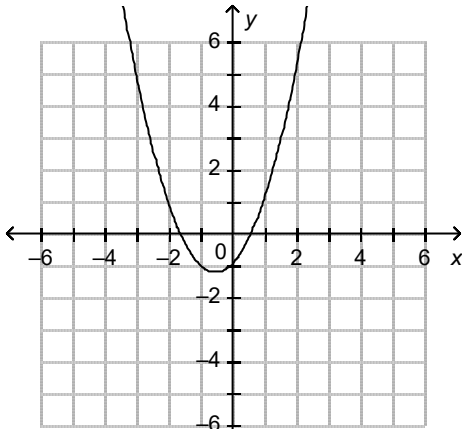
- a.  $(8b + 7)(8b - 7)$                       c.  $(7b - 8)(7b - 8)$   
b.  $(7b + 8)(7b - 8)$                       d.  $(7b + 8)(7b + 8)$

- \_\_\_ 21. Factor:  $4x^2 - 25y^2$
- a.  $(5x + 2y)(5x - 2y)$                       c.  $(2x + 5y)(2x - 5y)$   
 b.  $(2x - 5y)(2x - 5y)$                       d.  $(2x + 5)(2x - 5)$
- \_\_\_ 22. Factor:  $9m^2 - 42m + 49$
- a.  $(5m + 1)^4$                                       c.  $(3m - 49)(3m - 1)$   
 b.  $(5m - 1)^4$                                       d.  $(3m - 7)(3m + 7)$
- \_\_\_ 23. Factor this polynomial expression:  $2(3x - 2)^2 + 9(3x - 2) - 5$
- a.  $2(3x - 2)(x + 5)$                               c.  $3(x + 1)(6x - 5)$   
 b.  $2(3x + 2)(x - 5)$                               d.  $3(x - 1)(6x + 5)$
- \_\_\_ 24. Factor:  $0.5x^2 - 0.02$
- a.  $0.5(x + 0.1)(x - 0.1)$                       c.  $0.5(x + 0.2)(x - 0.2)$   
 b.  $(0.5x + 0.2)(x - 0.2)$                       d.  $(0.5x + 0.1)(x - 0.1)$
- \_\_\_ 25. For a quadratic function, which characteristic of its graph is equivalent to the zero of the function?
- a. minimum point                                      c. y-intercept  
 b. maximum point                                      d. x-intercept
- \_\_\_ 26. Which graph represents the quadratic function  $y = 2x + x^2$ ?

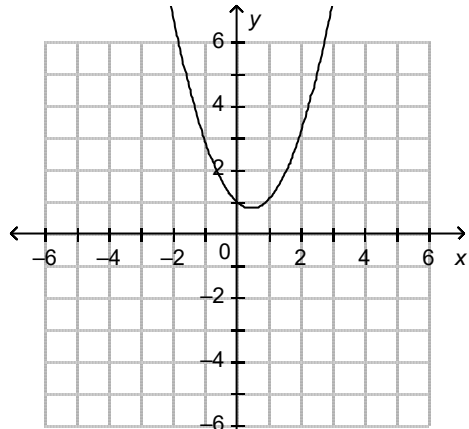


27. Which graph represents the quadratic function  $y = x^2 + x - 1$ ?

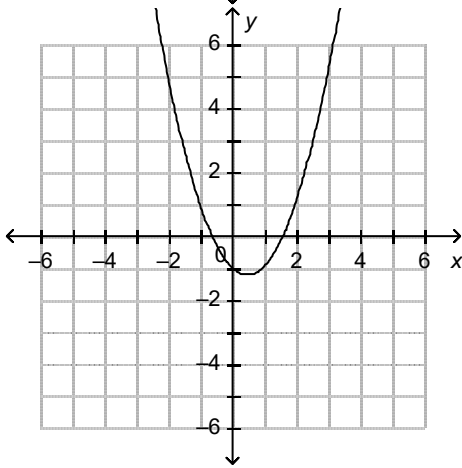
a.



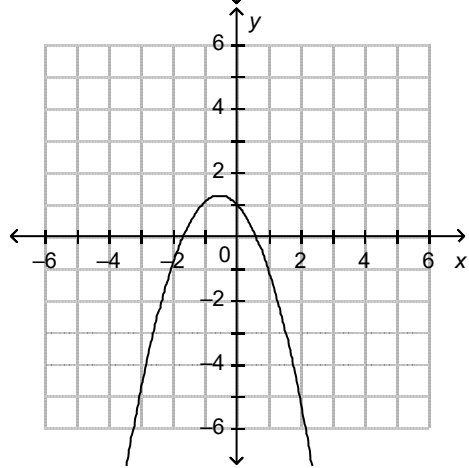
c.



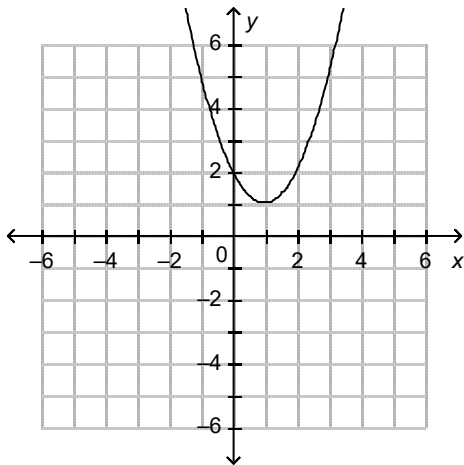
b.



d.



28. What are the coordinates of the vertex of this graph of the quadratic function  $y = x^2 - 2x + 2$ ? State whether it is a maximum point or a minimum point.



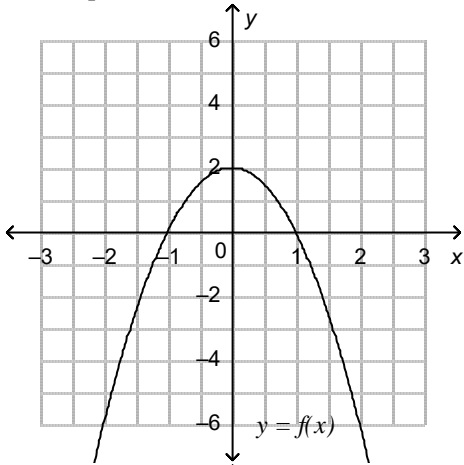
- a. (1, 2); minimum point
- b. (1, 2); maximum point

- c. (1, 1); maximum point
- d. (1, 1); minimum point

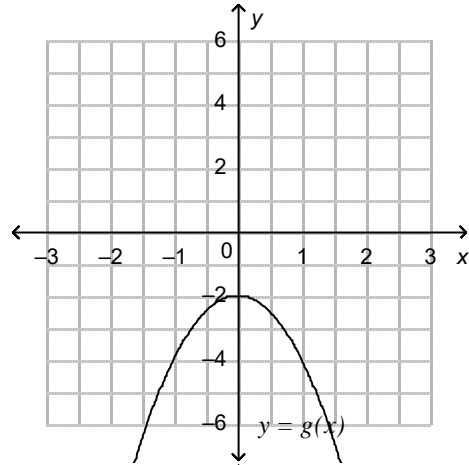
- \_\_\_\_\_ 29. Identify the y-intercept of the graph of this quadratic function:  $y = -3(x + 3)^2 + 4$   
a. 13                      b. -23                      c. -27                      d. 23
- \_\_\_\_\_ 30. Which of the following describes the translation that would be applied to the graph of  $y = x^2$  to get the graph of  $y = x^2 + 5$ ?  
a. Translate 5 units left                      c. Translate 5 units up  
b. Translate 5 units down                      d. Translate 5 units right
- \_\_\_\_\_ 31. Which statement is NOT true for the graph of  $y = x^2 + q$ ?  
a. When  $q$  is positive, the graph lies above the  $x$ -axis.  
b. As  $q$  increases, the graph moves up.  
c. The graph has the same size and shape as the graph of  $y = x^2$ .  
d. When  $q$  is negative, the vertex is above the  $x$ -axis.
- \_\_\_\_\_ 32. Which statement is NOT true for the graph of  $y = ax^2$ ?  
a. The vertex of the graph is always at the origin.  
b. When  $a$  is less than  $-1$ , the graph is the image of the graph of  $y = x^2$  after a vertical stretch and a reflection in the  $x$ -axis.  
c. When  $a$  is greater than 1, the graph is the image of the graph of  $y = x^2$  after a vertical stretch.  
d. When  $0 < a < 1$ , the graph is the image of the graph of  $y = x^2$  after a vertical compression and a reflection in the  $x$ -axis.
- \_\_\_\_\_ 33. Identify the coordinates of the vertex of the graph of this quadratic function:  $y = \frac{1}{8}(x - 4)^2 - 4$   
a. (4, 4)                      b. (-4, 4)                      c. (-4, -4)                      d. (4, -4)

34. Match the quadratic function  $y = 2x^2 + 2$  to a graph below.

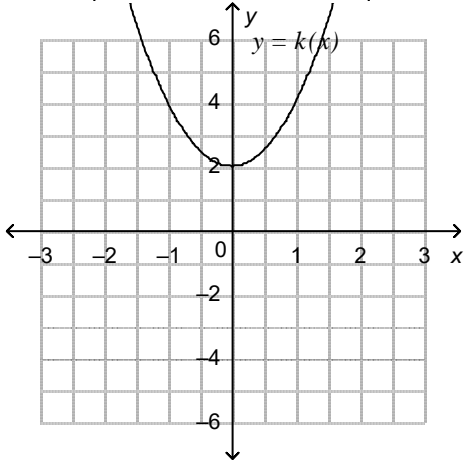
a.



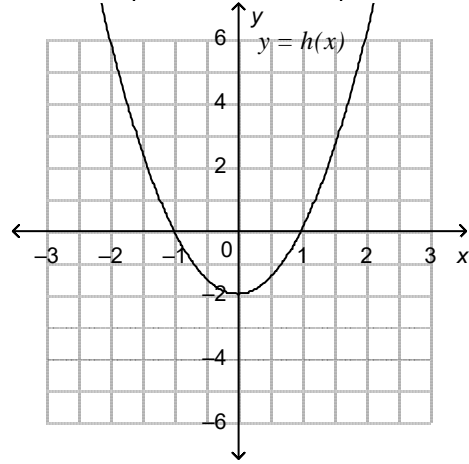
c.



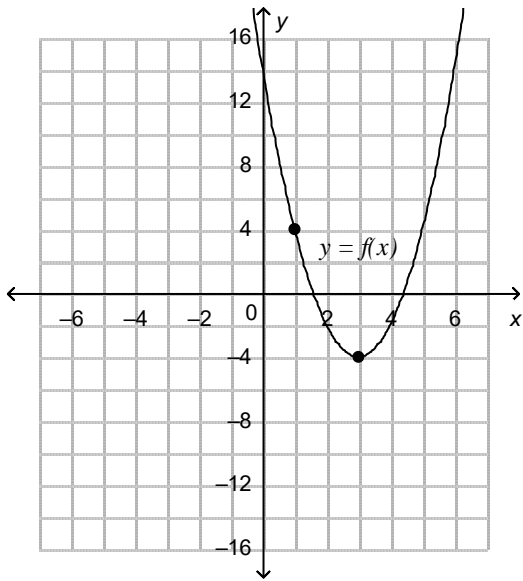
b.



d.



35. Determine an equation of this graph of a quadratic function.



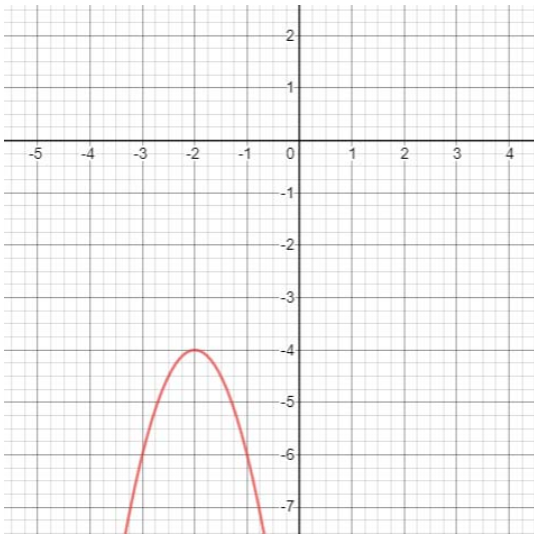
a.  $y = 2(x - 3)^2 - 4$

b.  $y = 2(x - 3)^2$

c.  $y = 2(x + 3)^2 - 4$

d.  $y = -2(x - 3)^2 - 4$

36. Determine an equation of this graph of a quadratic function.



- a.  $y = 2(x + 2)^2 - 4$                       c.  $y = -2(x + 2)^2$   
 b.  $y = -2(x - 2)^2 - 4$                       d.  $y = -2(x + 2)^2 - 4$

37. Determine an equation of a quadratic function with the given characteristics of its graph: coordinates of the vertex:  $V(0, 2)$ ; passes through  $A(-2, -18)$

- a.  $y = -2x^2 + 2$                                       c.  $y = -5x^2 - 2$   
 b.  $y = -18x^2 - 2$                                       d.  $y = -5x^2 + 2$

38. Which equation represents the same quadratic function as  $y = (x + 3)^2 - 1$ ?

- a.  $y = x^2 - 6x + 8$                                       c.  $y = x^2 - 2x + 8$   
 b.  $y = x^2 + 8x + 6$                                       d.  $y = x^2 + 6x + 8$

39. Determine the number that would be added to  $x^2 + 10x$  to get a perfect square trinomial.

- a. 100                                      b. 10                                      c. 25                                      d. 625

40. Write this equation in vertex form:  $y = x^2 - 12x + 28$

- a.  $y = (x - 12)^2 + 34$                                       c.  $y = (x - 6)^2 - 8$   
 b.  $y = (x - 6)^2 + 64$                                       d.  $y = (x - 12)^2 - 8$

41. Write this equation in vertex form:  $y = -3x^2 + 12x - 16$

- a.  $y = (x - 2)^2 - 4$                                       c.  $y = -3(x - 2)^2 - 4$   
 b.  $y = -3(x + 2)^2 + 4$                                       d.  $y = -3(x + 2)^2 - 4$

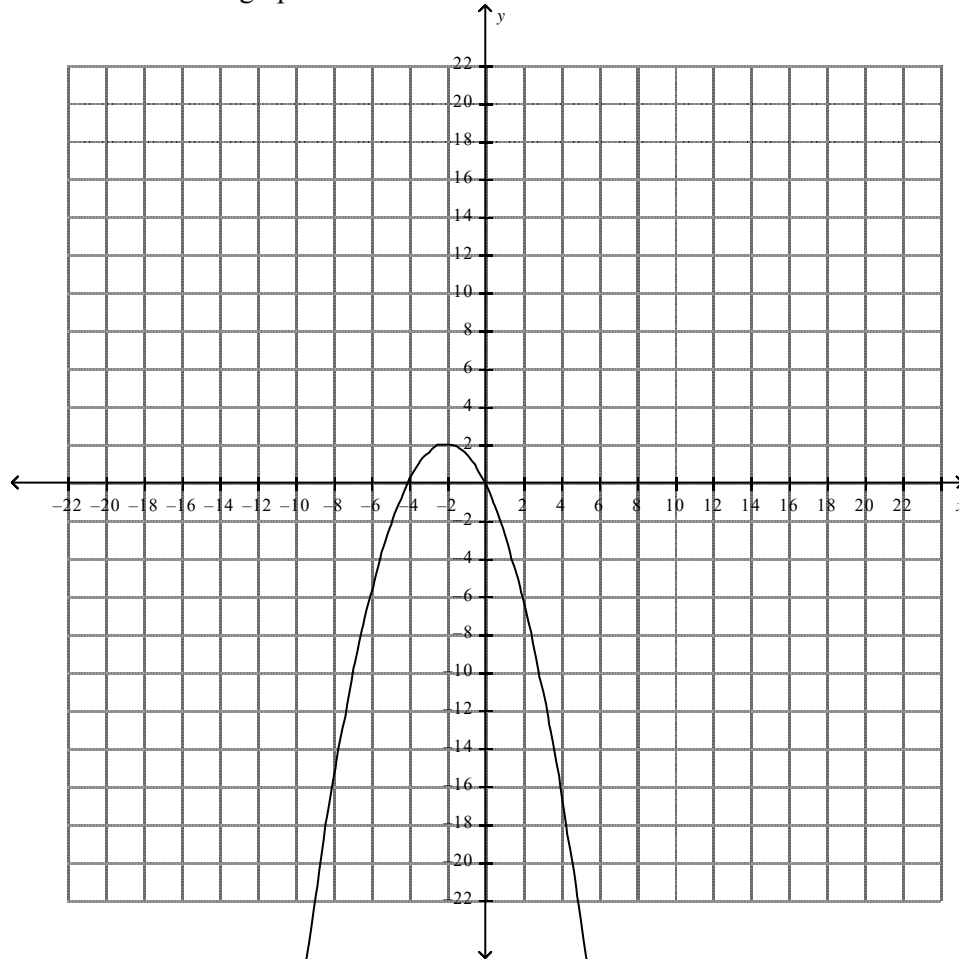
42. A sports equipment company sells skates for \$65 a pair. At this price, the company sells approximately 200 pairs a week. For every increase in price of  $x$  dollars, the company will sell  $40x$  fewer pairs. Determine the equation that should be used to maximize the revenue,  $R$  dollars.

- a.  $R = (65 + x)(100 - 40x)$                                       c.  $R = (65 - x)(100 + 40x)$   
 b.  $R = (65 + x)(200 - 20x)$                                       d.  $R = (65 + x)(200 - 40x)$

\_\_\_ 43. What are the domain and range of  $y = 7(x - 1)^2 - 9$ ?

- a. Domain:  $\{x|x \leq -1, x \in \mathcal{R}\}$   
Range:  $\{y|y \in \mathcal{R}\}$
- b. Domain:  $\{x|x \in \mathcal{R}\}$   
Range:  $\{y|y \geq -9, y \in \mathcal{R}\}$
- c. Domain:  $\{x|x \geq 7, x \in \mathcal{R}\}$   
Range:  $\{y|y \in \mathcal{R}\}$
- d. Domain:  $\{x|x \in \mathcal{R}\}$   
Range:  $\{y|y \leq -1, y \in \mathcal{R}\}$

\_\_\_ 44. Identify the characteristics of this graph.



- a. vertex:  $(-2, 2)$   
axis of symmetry:  $x = 2$   
y-intercept: 0  
x-intercepts:  $-0$  and 4  
opens upward
- b. vertex:  $(-2, 2)$   
axis of symmetry:  $x = -2$   
y-intercept: 0  
x-intercepts: 0 and  $-4$   
opens downward
- c. vertex:  $(2, -2)$   
axis of symmetry:  $x = 2$   
y-intercept: 0  
x-intercepts: 0 and  $-4$   
opens downward
- d. vertex:  $(2, -2)$   
axis of symmetry:  $x = 2$   
y-intercept: 0  
x-intercepts: 0 and  $-4$   
opens upward

\_\_\_ 45. Identify the  $x$ -intercepts of the graph of this quadratic function:  $y = (x - 3)(x + 1)$

- a. 3 and 1
- b. 3 and  $-1$
- c.  $-3$  and 1
- d.  $-3$  and  $-1$



- \_\_\_ 46. Determine the zeros of this quadratic function:  $y = x^2 - 4x - 32$
- a. 4 and -8                      b. -4 and 8                      c. 4 and 8                      d. -4 and -8
- \_\_\_ 47. Determine the  $x$ -intercepts and the coordinates of the vertex of the graph of  $y = x^2 - 6x + 8$ .
- a. 2 and -4; (3, 1)                      c. -2 and 4; (-3, -1)  
b. 2 and 4; (3, 1)                      d. -2 and -4; (-3, 1)
- \_\_\_ 48. Solve the following quadratic equation:  $4x^2 - 8x + 3 = 0$
- a.  $x = -\frac{1}{2}$  and  $x = -\frac{3}{2}$                       c.  $x = \frac{2}{3}$  and  $x = 2$   
b.  $x = \frac{1}{2}$  and  $x = \frac{3}{2}$                       d.  $x = -2$  and  $x = -6$
- \_\_\_ 49. Solve the following quadratic equation:  $8x^2 - 13x - 6 = 0$
- a.  $x = -\frac{3}{8}$  and  $x = 2$                       c.  $x = \frac{3}{8}$  and  $x = -2$   
b.  $x = -\frac{3}{2}$  and  $x = \frac{1}{2}$                       d.  $x = \frac{1}{4}$  and  $x = 3$
- \_\_\_ 50. Solve  $(x+1)^2 = 43$ .
- a.  $1 + \sqrt{43}$  and  $1 - \sqrt{43}$                       c.  $2\sqrt{11}$   
b.  $-1 + \sqrt{43}$  and  $-1 - \sqrt{43}$                       d.  $\sqrt{42}$
- \_\_\_ 51. Which radical expression simplifies to  $2\sqrt{2}$ ?
- a.  $\sqrt{4}$                       b.  $\sqrt{8}$                       c.  $\sqrt{16}$                       d.  $\sqrt{9}$
- \_\_\_ 52. Which radical expression simplifies to  $9\sqrt{2}$ ?
- a.  $\sqrt{32} - \sqrt{8} + 7\sqrt{2}$                       c.  $\sqrt{32} + 7\sqrt{8} - \sqrt{2}$   
b.  $\sqrt{32} - 7\sqrt{2} + \sqrt{8}$                       d.  $\sqrt{2} + 7\sqrt{8} - \sqrt{32}$
- \_\_\_ 53. Simplify by adding or subtracting like terms:  $8\sqrt{13} - 7\sqrt{13} + 5\sqrt{13}$
- a.  $6\sqrt{10}$                       b.  $\sqrt{78}$                       c.  $10\sqrt{13}$                       d.  $6\sqrt{13}$
- \_\_\_ 54. Simplify by adding or subtracting like terms:  $\sqrt{9} + \sqrt{125} - \sqrt{81} + \sqrt{3125}$
- a.  $-8\sqrt{5}$                       c.  $30\sqrt{3} - 6$   
b.  $-8\sqrt{3}$                       d.  $30\sqrt{5} - 6$
- \_\_\_ 55. Expand and simplify this expression:  $-\sqrt{2}(\sqrt{7} - 5)$
- a.  $-\sqrt{14} + 5\sqrt{2}$                       c.  $-2\sqrt{7} + 5\sqrt{2}$   
b.  $-7\sqrt{2} + \sqrt{10}$                       d.  $\sqrt{14} - \sqrt{10}$
- \_\_\_ 56. Expand and simplify this expression:  $(\sqrt{7} + 7)(\sqrt{3} - 2)$
- a.  $\sqrt{21} - 2\sqrt{7} + 7\sqrt{3} - 14$                       c.  $7\sqrt{3} - 2\sqrt{7} + 7\sqrt{7} - 14$   
b.  $\sqrt{21} + 3\sqrt{7} + 7\sqrt{3} + \sqrt{49}$                       d.  $\sqrt{21} - 14\sqrt{7} - 14$

\_\_\_ 57. Rationalize the denominator:  $\frac{7}{7\sqrt{5}}$

a.  $\frac{7\sqrt{5}}{35}$       b.  $\frac{7\sqrt{5}}{5}$       c.  $\frac{35\sqrt{5}}{5}$       d.  $\frac{49\sqrt{5}}{7}$

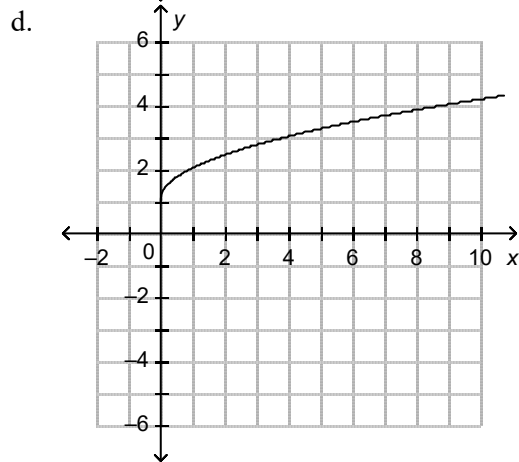
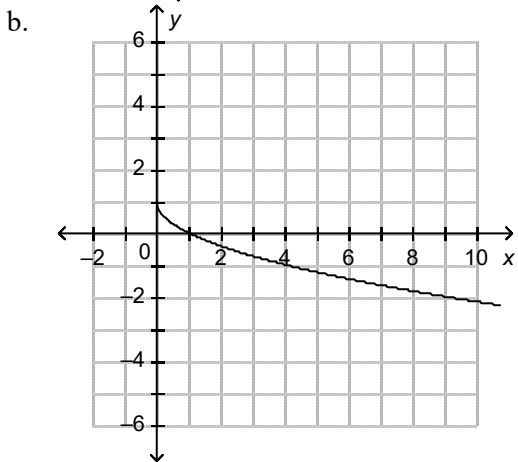
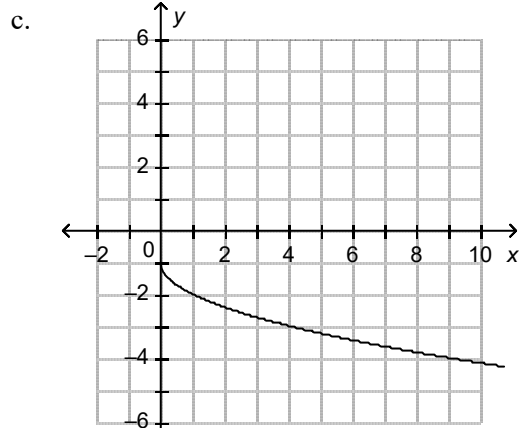
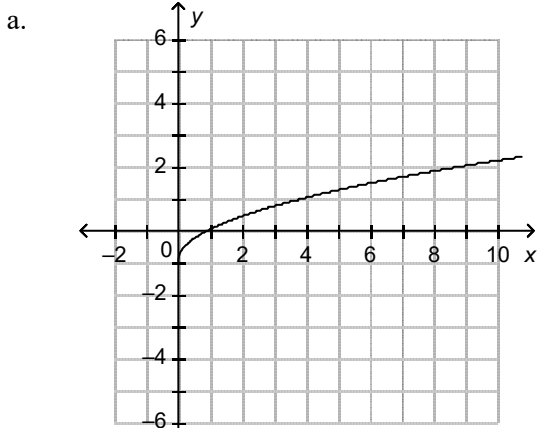
\_\_\_ 58. Expand and simplify this expression:  $(\sqrt{5} - 3)(5\sqrt{5} + 4) - (4\sqrt{5} - 5)^2$

a.  $-92 + 29\sqrt{5}$       c.  $-18 + 29\sqrt{5}$   
 b.  $-18 + 31\sqrt{5}$       d.  $-92 + 31\sqrt{5}$

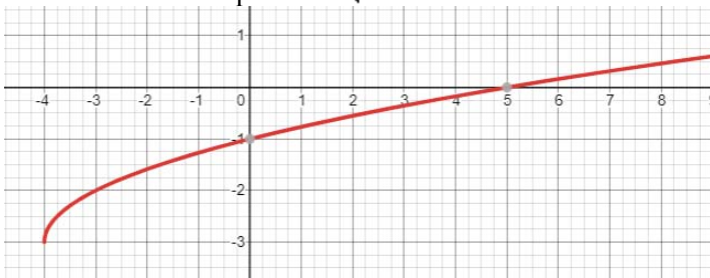
\_\_\_ 59. Simplify this expression:  $\frac{-9\sqrt{5} - 3}{\sqrt{5}}$

a.  $\frac{-9 - 15\sqrt{5}}{5}$       c.  $\frac{-45\sqrt{5} - 15}{5}$   
 b.  $-225 - 3\sqrt{5}$       d.  $\frac{-45 - 3\sqrt{5}}{5}$

\_\_\_ 60. Which graph is a graph for the radical function:  $y = \sqrt{x} - 1$ ?



61. Solve this radical equation  $\sqrt{x+4} - 3 = 0$



- a.  $x = 6$                       b.  $x = -5$                       c.  $x = 7$                       d.  $x = 5$

62. Determine two related functions that can be graphed to solve the radical equation:  $\sqrt{x+2} - 5x = 10$

- a.  $y = \sqrt{x+2}$ ;  $y = 5x + 10$                       c.  $y = -\sqrt{x+2}$ ;  $y = 5x - 10$   
 b.  $y = -\sqrt{x+2}$ ;  $y = 10 - 5x$                       d.  $y = \sqrt{x+2}$ ;  $y = -5x - 10$

63. Solve this equation:  $9\sqrt{x} = 4$

- a.  $x = \frac{16}{81}$                       b.  $x = \frac{81}{16}$                       c.  $x = \frac{4}{9}$                       d.  $x = \frac{9}{4}$

64. Solve this equation:  $\sqrt{x-3} - 7 = -5$

- a.  $x = 1$                       b.  $x = 4$                       c.  $x = 7$                       d.  $x = 5$

65. Solve this equation:  $9 = \sqrt{135 - 6x}$

- a.  $x = 8$                       b.  $x = 9$                       c.  $x = 10$                       d.  $x = 7$

66. Which of the following are the non-permissible values for this rational expression?

$$\frac{n^2 - 2n - 3}{n^3 - 4n^2 + 3n}$$

- a.  $n = 0$  and  $n = 1$                       c.  $n = 0$ ,  $n = -3$ , and  $n = -1$   
 b.  $n = 0$  and  $n = -1$                       d.  $n = 0$ ,  $n = 3$ , and  $n = 1$

67. Simplify this rational expression and state the non-permissible values of the variable.

$$\frac{m^2 - 16}{m^2 + 6m + 8}$$

- a.  $\frac{m+4}{m+2}$ ;  $m = -4$  and  $m = 2$                       c.  $\frac{m-4}{m+2}$ ;  $m = 4$  and  $m = 2$   
 b.  $\frac{m+4}{m+2}$ ;  $m = -4$  and  $m = -2$                       d.  $\frac{m-4}{m+2}$ ;  $m = -4$  and  $m = -2$

68. Simplify this expression:

$$\frac{7}{q} \div \frac{5x}{3q}$$

- a.  $\frac{21q^2}{5x}$ ,  $x \neq 0$                       c.  $\frac{35x}{3q^2}$ ,  $q \neq 0$ ,  $x \neq 0$   
 b.  $\frac{21}{5x}$ ,  $q \neq 0$ ,  $x \neq 0$                       d.  $35x$ ,  $q \neq 0$

69. Simplify this expression:

$$\frac{5p}{2} \cdot \frac{4p}{p}$$

a.  $\frac{9p}{2}, p \neq 0$

b.  $10p, p \neq -2$

c.  $\frac{5p}{8}, p \neq 0$

d.  $10p, p \neq 0$

70. Simplify this expression:

$$\frac{2x+4}{x} \div \frac{2}{x-6}$$

a.  $2x^2 - 8x - 24, x \neq 0, x \neq 6$

c.  $\frac{(x+2)(x-6)}{x}, x \neq 0, x \neq 6$

b.  $\frac{4(x+2)}{x(x-6)}, x \neq 0, x \neq 6$

d.  $\frac{x-12}{x}, x \neq 0, x \neq 6$

71. Simplify.

$$\frac{5}{a} + \frac{9}{7}$$

a.  $\frac{14}{a+7}, a \neq -7$

c.  $\frac{9a+35}{7a}, a \neq 0$

b.  $\frac{9a+35}{a+7}, a \neq -7$

d.  $\frac{14}{7a}, a \neq 0$

72. Simplify.

$$\frac{d+5}{d^2} + \frac{2}{d} - 3$$

a.  $\frac{d+4}{d^2}, d \neq 0$

c.  $\frac{-3d^2+3d+5}{d^2}, d \neq 0$

b.  $\frac{-3d^2+3d+5}{2d^2}, d \neq 0$

d.  $\frac{d+4}{2d^2}, d \neq 0$

73. Simplify.

$$pq - \frac{p-q}{p} + \frac{p+q}{q}$$

a.  $1, p \neq 0, q \neq 0$

c.  $\frac{p^2q^2+p^2+q^2+2pq}{pq}, p \neq 0, q \neq 0$

b.  $\frac{p^2q^2+p^2+q^2}{pq}, p \neq 0, q \neq 0$

d.  $\frac{pq}{p+q}, p \neq 0, q \neq 0$

74. Simplify.

$$\frac{r+6}{r-2} + \frac{4}{2-r}$$

a.  $\frac{r+10}{r-2}, r \neq 2$

c.  $\frac{r+10}{(r-2)^2}, r \neq 2$

b.  $\frac{r+2}{(r-2)^2}, r \neq 2$

d.  $\frac{r+2}{r-2}, r \neq 2$

75. Simplify.

$$\frac{x-2}{x+6} + \frac{x+4}{x-1}$$

a.  $\frac{2x^2+7x+26}{x+5}$ ,  $x \neq -6$ ,  $x \neq 1$ ,  $x \neq -5$

b.  $\frac{x+2}{x+5}$ ,  $x \neq -6$ ,  $x \neq 1$ ,  $x \neq -5$

c.  $\frac{2x^2+7x+26}{(x+6)(x-1)}$ ,  $x \neq -6$ ,  $x \neq 1$

d.  $\frac{x+2}{(x+6)(x-1)}$ ,  $x \neq -6$ ,  $x \neq 1$

76. Simplify.

$$\frac{a}{a^2-144} - \frac{3a-1}{a^2+10a-24}$$

a.  $\frac{-2a^2+35a-12}{(a+12)(a-12)(a-2)}$ ,  $a \neq 12$ ,  $a \neq -12$ ,  $a \neq 2$

b.  $\frac{3a^2-a}{-10a-120}$ ,  $a \neq 120$

c.  $\frac{-2a+1}{-10(a+12)}$ ,  $a \neq -12$

d.  $\frac{-2a+1}{(a+12)(a-12)(a-2)}$ ,  $a \neq 12$ ,  $a \neq -12$ ,  $a \neq 2$

77. Solve.

$$\frac{16}{n} = \frac{n}{9}$$

a.  $n = \frac{9}{16}$

b.  $n = 12$  or  $n = -12$

c.  $n = 144$  or  $n = -144$

d.  $n = \frac{16}{9}$

78. Solve.

$$\frac{w-5}{w^2} = \frac{1}{20}$$

a.  $w = 10$

b.  $w = 10$  or  $w = -10$

c.  $w = -5$

d. no solution

79. Simplify:  $\frac{\frac{3}{4} + 2x}{\frac{3}{4} - 2x}$

a.  $\frac{3-16x}{3+8x}$

b. -1

c.  $\frac{3}{16x}$

d.  $\frac{3+8x}{3-8x}$

80. Solve.

$$\frac{25}{w-6} = \frac{w-6}{w}$$

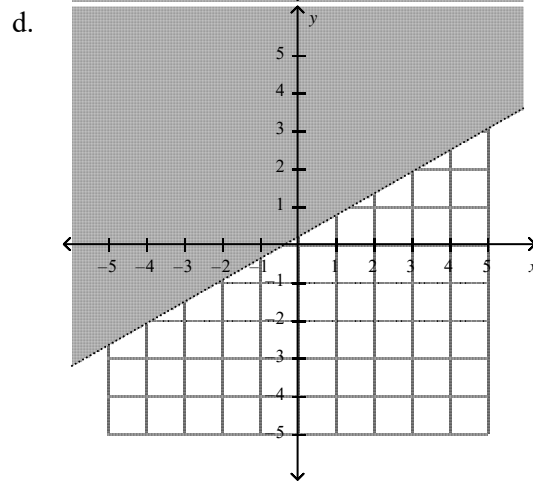
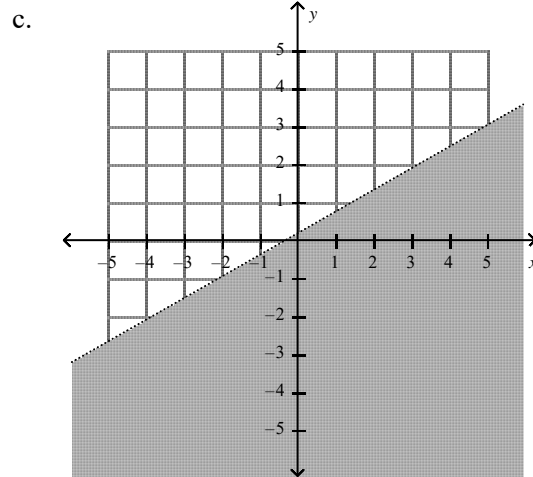
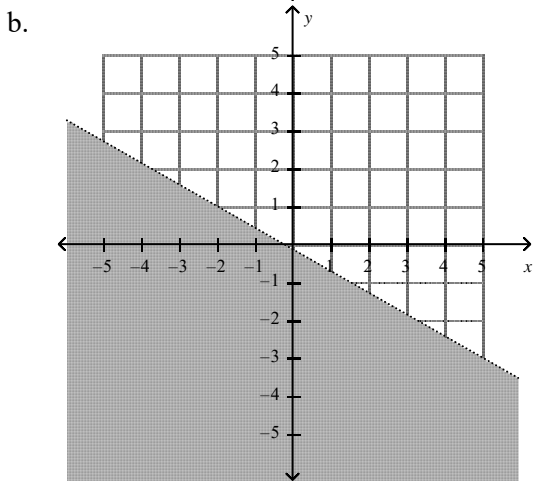
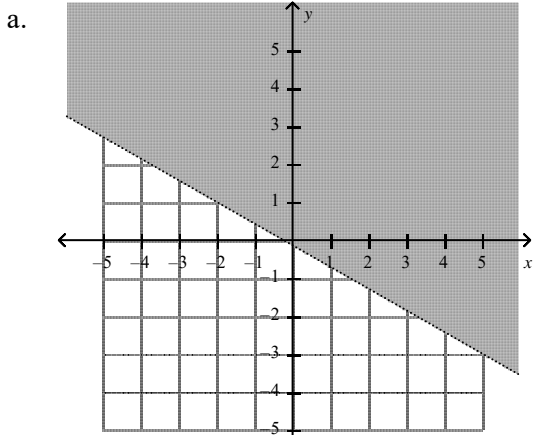
- a.  $w = 1$  or  $w = -36$   
b.  $w = -1$  or  $w = 36$

- c.  $w = 1$  or  $w = 36$   
d. no solution

81. A freight train travels 60 km. A single locomotive pulls the train for the first half of the trip, then a second locomotive is added, doubling the speed of the train. If the total time for the trip is 54 min, what is the speed of the train with one locomotive?

- a. 267 km/h      b. 133 km/h      c. 233 km/h      d. 50 km/h

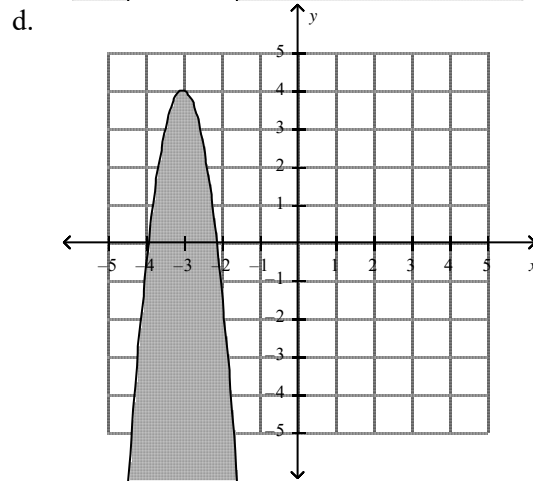
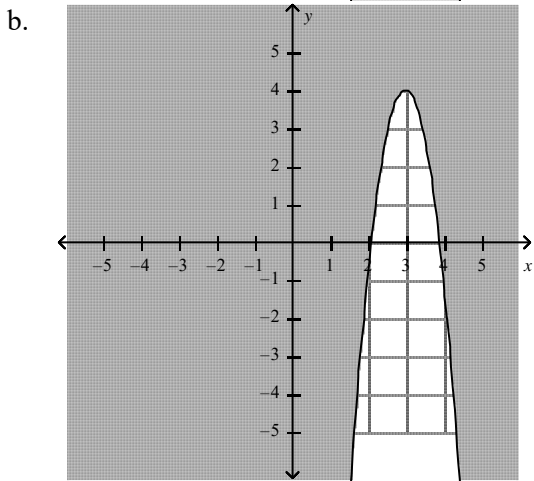
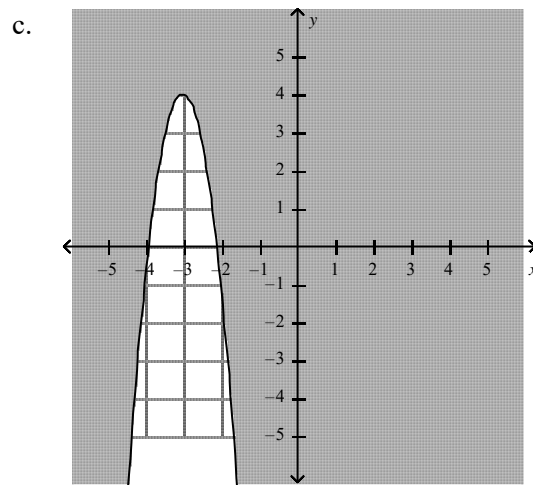
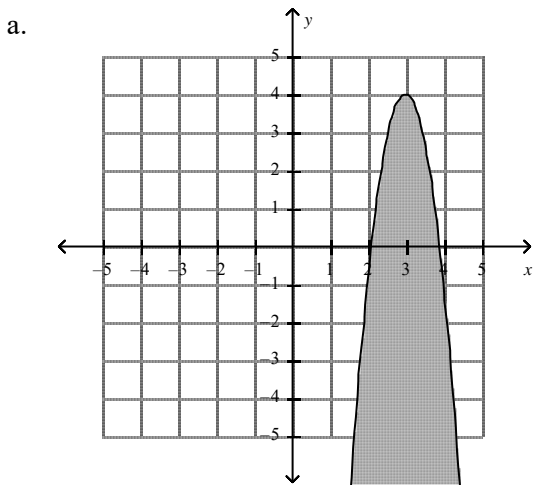
82. The graph of  $-4x + 7y > 1$  is



83. Solve the linear inequality:  $\frac{2}{3}x + 1 \geq 0$

- a.  $x < -1.5$       b.  $x \geq -1.5$       c.  $x \geq 1.5$       d.  $x < 1$

84. Which interval below is the solution of the inequality  $4 + \frac{3}{4}x < 10$ ?
- a.  $x < 8$                       b.  $x > 8$                       c.  $x < -8$                       d.  $x > -8$
85. Which interval below is the solution of the inequality  $3 + x \leq 6$ ?
- a.  $[3, \infty)$                       b.  $[-\infty, -3)$                       c.  $(-\infty, 2]$                       d.  $(-\infty, 3]$
86. Solve the linear inequality  $13x - 11 < 13 + 14x$ . Write the solution in interval notation.
- a.  $x > -24$ ;  $(-24, \infty)$                       c.  $x > 8$ ;  $(8, \infty)$
- b.  $x < -3$ ;  $(-\infty, -3)$                       d.  $x < -24$ ;  $(-\infty, -24)$
87. Which graph represents the solution to the inequality  $y \leq -5(x + 3)^2 + 4$ ?



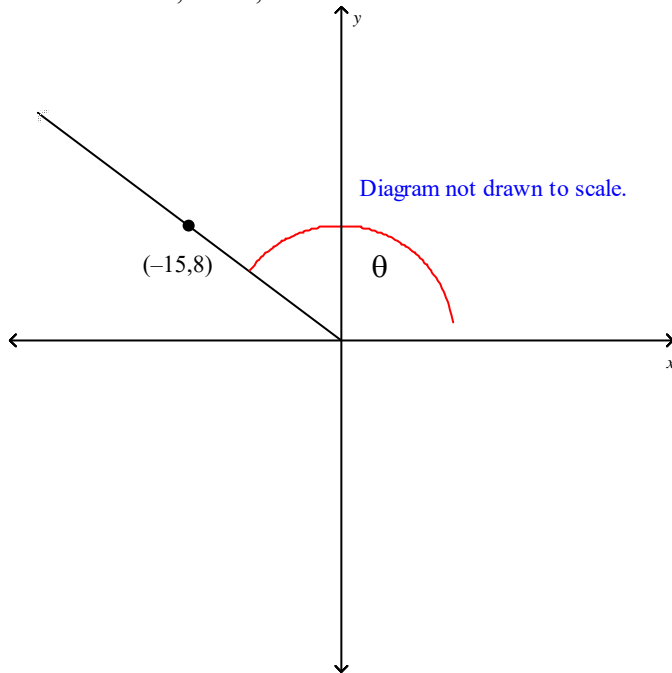
88. Which point does *not* satisfy the inequality  $y > -2(x - 3)^2 + 8$ ?
- a.  $(-9, -234)$                       c.  $(5, 16)$
- b.  $(1, 1)$                               d.  $(2, 0)$





96. What are the three other angles in standard position that have a reference angle of  $54^\circ$ ?
- a.  $99^\circ, 144^\circ, 234^\circ$                       c.  $144^\circ, 234^\circ, 324^\circ$   
 b.  $108^\circ, 162^\circ, 216^\circ$                       d.  $126^\circ, 234^\circ, 306^\circ$

97. The coordinates of a point P on the terminal arm of an angle are shown. What are the exact trigonometric ratios for  $\sin \theta$ ,  $\cos \theta$ , and  $\tan \theta$ ?

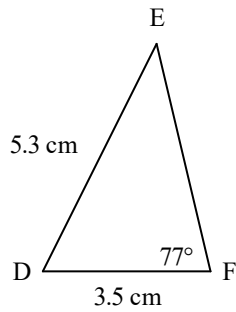


- a.  $\sin A = \frac{8}{17}, \cos A = -\frac{15}{17}, \tan A = -\frac{8}{15}$   
 b.  $\sin A = -\frac{15}{17}, \cos A = \frac{8}{17}, \tan A = -\frac{15}{8}$   
 c.  $\sin A = \frac{15}{17}, \cos A = -\frac{8}{17}, \tan A = -\frac{8}{15}$   
 d.  $\sin A = \frac{17}{8}, \cos A = -\frac{17}{15}, \tan A = -\frac{8}{15}$

98. Which angle is NOT coterminal with an angle of  $190^\circ$  in standard position?
- a.  $-170^\circ$                       b.  $-530^\circ$                       c.  $370^\circ$                       d.  $550^\circ$

99. Which expression represents the measures of all the angles coterminal with an angle of  $203^\circ$  in standard position?
- a.  $23^\circ + k360^\circ, k \in I$                       c.  $203^\circ + k180^\circ, k \in I$   
 b.  $203^\circ + k360^\circ, k \in R$                       d.  $203^\circ + k360^\circ, k \in I$

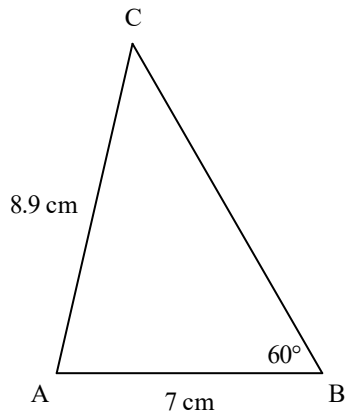
\_\_\_ 100. For  $\triangle DEF$ , write the Sine Law equation you would use to determine the measure of  $\angle E$ .



a.  $\frac{3.5}{\sin E} = \frac{5.3}{\sin 63^\circ}$   
b.  $\frac{\sin E}{3.5} = \frac{\sin 63^\circ}{5.3}$

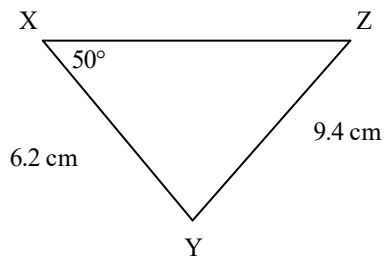
c.  $\frac{\sin E}{3.5} = \frac{\sin 77^\circ}{5.3}$   
d.  $\frac{3.5}{\sin E} = \frac{\sin 77^\circ}{5.3}$

\_\_\_ 101. For  $\triangle ABC$ , determine the measure of  $\angle A$  to the nearest degree.



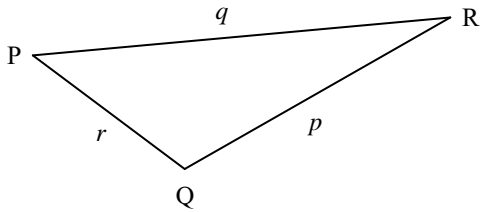
- a. 120°      b. 77°      c. 43°      d. 144°

\_\_\_ 102. For  $\triangle XYZ$ , determine the measure of  $\angle Z$  to the nearest degree and the measure of XZ to the nearest tenth of a centimetre.



- a.  $\angle Z = 28^\circ$ ; XZ = 7.3 cm      c.  $\angle Z = 53^\circ$ ; XZ = 8.0 cm  
b.  $\angle Z = 59^\circ$ ; XZ = 4.8 cm      d.  $\angle Z = 30^\circ$ ; XZ = 12.1 cm

\_\_\_ 103. For  $\triangle PQR$ , write the Cosine Law equation you would use to determine the measure of  $\angle Q$ .



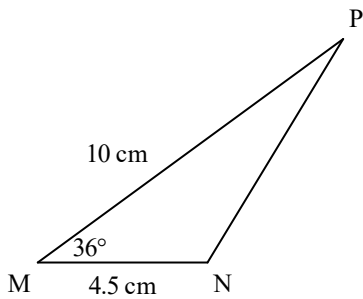
a.  $r^2 = p^2 + q^2 - 2pq \cos R$

c.  $q^2 = p^2 + r^2 - 2pr \cos Q$

b.  $r^2 = p^2 + q^2 - 2pq \cos Q$

d.  $p^2 = q^2 + r^2 - 2qr \cos P$

\_\_\_ 104. In  $\triangle PMN$ , determine the length of PN to the nearest tenth of a centimetre.



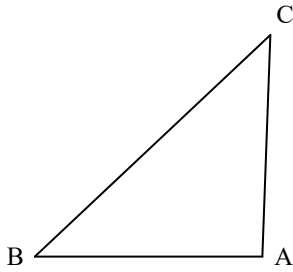
a. 13.9 cm

b. 47.4 cm

c. 9.2 cm

d. 6.9 cm

\_\_\_ 105. In  $\triangle ABC$ ,  $AB = 6$  cm,  $BC = 8.5$  cm, and  $AC = 5.8$  cm. Determine the measure of  $\angle B$  to the nearest degree.



a.  $28^\circ$

b.  $91^\circ$

c.  $43^\circ$

d.  $0^\circ$

Pre-Calculus 11 - Final Exam Review Solutions

- |       |       |        |
|-------|-------|--------|
| 1. A  | 45. B | 89. B  |
| 2. B  | 46. B | 90. D  |
| 3. D  | 47. B | 91. A  |
| 4. B  | 48. B | 92. A  |
| 5. C  | 49. A | 93. C  |
| 6. C  | 50. B | 94. C  |
| 7. B  | 51. B | 95. D  |
| 8. B  | 52. A | 96. D  |
| 9. C  | 53. D | 97. A  |
| 10. D | 54. D | 98. C  |
| 11. A | 55. A | 99. D  |
| 12. A | 56. A | 100. C |
| 13. A | 57. A | 101. B |
| 14. A | 58. A | 102. D |
| 15. B | 59. D | 103. C |
| 16. A | 60. A | 104. D |
| 17. B | 61. D | 105. C |
| 18. B | 62. A |        |
| 19. D | 63. A |        |
| 20. B | 64. C |        |
| 21. C | 65. B |        |
| 22. B | 66. D |        |
| 23. C | 67. D |        |
| 24. C | 68. B |        |
| 25. D | 69. D |        |
| 26. C | 70. C |        |
| 27. A | 71. C |        |
| 28. A | 72. C |        |
| 29. B | 73. B |        |
| 30. C | 74. D |        |
| 31. D | 75. C |        |
| 32. D | 76. A |        |
| 33. D | 77. B |        |
| 34. B | 78. A |        |
| 35. A | 79. D |        |
| 36. D | 80. C |        |
| 37. D | 81. D |        |
| 38. D | 82. D |        |
| 39. C | 83. B |        |
| 40. C | 84. A |        |
| 41. C | 85. D |        |
| 42. D | 86. A |        |
| 43. B | 87. D |        |
| 44. B | 88. D |        |