

Summer Review for Students Entering Honors Precalculus 2018

Name: _____ Date: _____

1. Find the solution set of the equation.

$$30c + 2 = 11 + 25c$$

- A) $\{13/55\}$
- B) $\{42\}$
- C) $\{9/5\}$
- D) $\{68\}$

2. Find the solution set of the equation.

$$2(x - 1) - 4 = x - 4(x - 3)$$

- A) $\{5/18\}$
- B) $\{2/5\}$
- C) $\{18/5\}$
- D) $\{5/2\}$

3. Clear the fractions by first multiplying by the least common denominator, and then find the solution set of the equation.

$$\frac{p}{5} = \frac{7p}{6} + 5$$

- A) $\{-5/6\}$
- B) $\{1/10\}$
- C) $\{10\}$
- D) $\{-150/29\}$

4. The area, A , of a rectangle is the amount of two-dimensional space it takes up and can be found by solving the formula $A = lw$, where l is the length and w is the width. What is the length of a rectangle whose area is 45 square inches and whose width is 9 inches?

- A) 36 inches
- B) 27 inches
- C) 9 inches
- D) 5 inches

5. Lacie decides to start a small business making monogrammed towels. She can set aside \$3,220 for monthly costs. Fixed costs are \$2,000 per month and variable costs are \$7 per set of towels. How many sets of towels can she afford to make per month?
- A) 745
 - B) 460
 - C) 285
 - D) 174
6. Jessica has \$14500 to invest and decides to put some in a CD that earns 1.5% interest per year and the rest in a low risk stock that earns 1.8%. How much did she invest to earn \$247.65 interest in the first year?
- A) \$7,504.55 at 1.5% and \$6,995.45 at 1.8%
 - B) \$10,050 at 1.5% and \$4,450.00 at 1.8%
 - C) \$4,450.00 at 1.5% and \$10,050 at 1.8%
 - D) \$6,995.45 at 1.5% and \$7,504.55 at 1.8%
7. A motorboat can maintain a constant speed of 11 miles per hour relative to the water. The boat makes a trip upstream in 41 minutes and the return trip takes 22 minutes. What is the speed of the current?
- A) 0.3 mph
 - B) 11 mph
 - C) 3.3 mph
 - D) 22 mph
8. Lee can mow a lawn in 30 minutes. It takes Ito 50 minutes to mow a lawn of the same size. How long would it take them to mow the lawn if they work together?
- A) 40.0 minutes
 - B) 20 minutes
 - C) 18.7 minutes
 - D) 80 minutes
9. Solve by factoring.
- $$x^2 + 3x = 10$$
- A) $\{-2,5\}$
 - B) $\{2,-5\}$
 - C) $\{-2,-5\}$
 - D) $\{2,5\}$

10. Solve by factoring.

$$3x^2 + 16 = 16x$$

- A) $\{-4/3, 4\}$
- B) $\{4/3, 4\}$
- C) $\{3/4, 4\}$
- D) $\{-3/4, 4\}$

11. Solve by using the square root method.

$$x^2 = 81$$

- A) $\{-9, 9\}$
- B) $\{-9\}$
- C) $\{9\}$
- D) $\{81, -81\}$

12. Solve using the square root method.

$$(x - 5)^2 = 4$$

- A) $\{7\}$
- B) $\{7, 3\}$
- C) $\{3\}$
- D) $\{10\}$

13. Solve using the square root method.

$$(x + 15)^2 = 10$$

- A) $\{15 + \sqrt{10}, 15 - \sqrt{10}\}$
- B) $\{-15 + \sqrt{10}\}$
- C) $\{-15, \sqrt{10}\}$
- D) $\{-15 + \sqrt{10}, -15 - \sqrt{10}\}$

14. Solve using the square root method.

$$(x - 6)^2 = -49$$

- A) $\{6 + 7i, 6 - 7i\}$
- B) $\{6 + 7i\}$
- C) $\{13\}$
- D) $\{13, -1\}$

15. Solve using the quadratic formula.

$$16y^2 + 48y - 111 = 0$$

A) $\left\{ \frac{6 + 7\sqrt{3}}{4}, \frac{6 - 7\sqrt{3}}{4} \right\}$

B) $\left\{ \frac{6 + 7\sqrt{3}}{4} \right\}$

C) $\left\{ \frac{-6 + 7\sqrt{3}}{4}, \frac{-6 - 7\sqrt{3}}{4} \right\}$

D) $\left\{ \frac{-6 - 7\sqrt{3}}{4} \right\}$

16. Solve $c^2 - 64 = 0$ for c .

A) $\{-8\}$

B) $\{8\}$

C) $\{-8, 8\}$

D) no solution

17. Solve $z^2 = 4z$ for z .

A) $\{-2\}$

B) $\{0, 4\}$

C) $\{-2, 2\}$

D) $\{2\}$

18. Solve $b^2 + 16 = 0$ for b .

A) $\{-4\}$

B) $\{4\}$

C) $\{-4, 4\}$

D) $\{-4i, 4i\}$

19. Specify the values that must be excluded from the solution set.

$$\frac{2}{x} - 9 = \frac{20}{x-7}$$

- A) 0 and 7
- B) 7
- C) 0
- D) -7

20. Specify the values that must be excluded from the solution set.

$$\frac{16}{z-17} - \frac{4}{8} = \frac{25}{z+9}$$

- A) -9
- B) -17 and 9
- C) 17 and -9
- D) 17, 8, and -9

21. Find the solution set of the equation.

$$\frac{5}{6t} = 3 - \frac{1}{12t}$$

- A) {36/11}
- B) {9/36}
- C) {11/36}
- D) {3/2}

22. Find the solution set of the equation.

$$\frac{-10}{10p-11} = \frac{1}{p-1}$$

- A) $\{\phi\}$
- B) {19/20}
- C) {21/20}
- D) {1/20}

23. Find the solution set of the equation.

$$\frac{p^2 - 1}{7p + 49} = \frac{p}{7}$$

- A) $\{1/7\}$
- B) $\{7\}$
- C) $\{-7\}$
- D) $\{-1/7\}$

24. Solve.

$$5x + \frac{12}{x} = 19$$

- A) $\{-4/5, -3\}$
- B) $\{5/4, 3\}$
- C) $\{4/5, 3\}$
- D) $\{-5/4, -3\}$

25. Find the solution set of the radical equation.

$$\sqrt{x-1} = 7$$

- A) $\{8\}$
- B) $\{48\}$
- C) $\{1 + \sqrt{7}\}$
- D) $\{50\}$

26. Find the solution set of the radical equation.

$$\sqrt{3x-7} = 3$$

- A) $\{10/3\}$
- B) $\left\{\frac{7 + \sqrt{3}}{3}\right\}$
- C) $\{16/3\}$
- D) $\{2/3\}$

27. Find the solution set of the radical equation.

$$\sqrt[3]{1-2x} = -4$$

- A) $\{65/2\}$
- B) $\{-65/2\}$
- C) $\{15/2\}$
- D) $\{-15/2\}$

28. Find the solution set of the radical equation.

$$y = 7\sqrt{y}$$

- A) $\{0\}$
- B) $\{7\}$
- C) $\{49\}$
- D) $\{0,49\}$

29. Find the solution set of the radical equation.

$$\sqrt{200 - 20y} = y - 10$$

- A) $\{10\}$
- B) $\{10, -10\}$
- C) $\{0\}$
- D) $\{4.8\}$

30. Solve the radical equation.

$$x = 3\sqrt{2x - 9}$$

- A) $\{9\}$
- B) $\{-9, 9\}$
- C) $\{-9\}$
- D) $\{-3, 3\}$

31. Introduce a u - substitution that transforms the equation to quadratic form. Do not solve.

$$6x^{-4} - 11x^{-2} + 12 = 0$$

- A) $u = x^{-4}$
- B) $u = x^{-2}$
- C) $u = x^2$
- D) $u = x^4$

32. Find the solution set of the equation by introducing a substitution.

$$81x^4 - 18x^2 + 1 = 0$$

- A) $\{-1/9, 1/9\}$
- B) $\{1/9\}$
- C) $\{-1/3, 1/3\}$
- D) $\{1/3\}$

33. Solve the radical equation for the given variable.

$$\sqrt{2x-100} - \sqrt{x-100} = 10$$

- A) $\{100, 500\}$
- B) $\{210\}$
- C) $\{10\}$
- D) $\{\emptyset\}$

34. Solve by factoring.

$$3x^3 - 4x^2 - 48x + 64 = 0$$

- A) $\{4, -4, 4/3\}$
- B) $\{4, -4, -4/3\}$
- C) $\{4, -4, -4/3, 4/3\}$
- D) $\{4, 4/3\}$

35. The period (T) of a pendulum is related to the length (L) of the pendulum and acceleration

due to gravity (g) by the formula $T = 2\pi\sqrt{\frac{L}{g}}$. If the gravity is 32 ft/sec^2 and the period is

13 second, find the approximate length of the pendulum. Round to the nearest centimeter.

(Note: 12 in. = 1 ft)

- A) 1,644
- B) 160,124 in.
- C) 48 in.
- D) 795 in.

36. Solve $c^3 + 2c^2 - 48c = 0$ for c .

- A) $\{0, 6, -8\}$
- B) $\{0, -6, 8\}$
- C) $\{6, -8\}$
- D) $\{\emptyset\}$

37. Solve $x^3 + x^2 - 49x - 49 = 0$ for x .

- A) $\{1, -7, 7\}$
- B) $\{-7, -49\}$
- C) $\{-1, -7, 7\}$
- D) $\{-49\}$

38. Find the solution set of the equation.

$$|x + 3| = -5$$

- A) $\{-5, 5\}$
- B) $\{-5\}$
- C) $\{5\}$
- D) $\{\phi\}$

39. Find the solution set of the equation.

$$|2x - 7| = 15$$

- A) $\{11\}$
- B) $\{-11, 4\}$
- C) $\{-4, 11\}$
- D) $\{-4\}$

40. Find the solution set of the equation.

$$|5.5x - 2.7| = 4.9$$

- A) $\{1.38\}$
- B) $\{-0.40, 1.38\}$
- C) $\{-1.38, 0.40\}$
- D) $\{0.40, 1.38\}$

41. Find the distance between the points $(-3, 7)$ and $(30, 63)$

- A) 65
- B) 4,225
- C) 2,047
- D) $\sqrt{2,047}$

42. Find the midpoint of the segment joining the points $(-9, 10)$ and $(5, 0)$

- A) $(-2, 5)$
- B) $(-7, 5)$
- C) $(5, -2)$
- D) $(-4, 10)$

43. Find the midpoint of the segment joining the points $(-5, -3)$ and $(-6, -6)$.
- A) $(-11, -9)$
 - B) $(-5.5, -4.5)$
 - C) $(-0.5, -1.5)$
 - D) $(0.5, 1.5)$
44. Find the slope of the line that passes through the points $(0, -9)$ and $(6, 8)$.
- A) $6/17$
 - B) $17/6$
 - C) $-17/6$
 - D) $-6/17$
45. Find the slope of the line that passes through the points $(9, -4)$ and $(9, 6)$
- A) 2
 - B) -10
 - C) undefined
 - D) 0
46. Find the slope of the line that passes through the points $(7, 8)$ and $(-10, 8)$.
- A) $1/17$
 - B) 17
 - C) undefined
 - D) 0
47. Find the slope of the line whose equation is given by $x - 16y = 15$.
- A) 16
 - B) -16
 - C) $1/16$
 - D) $-1/16$
48. Find the slope of the line whose equation is given by $8x + y = 18$
- A) -8
 - B) 8
 - C) $1/8$
 - D) $-1/8$

49. Find the slope of the line whose equation is given by $x = -8$.
- A) -8
 - B) 8
 - C) undefined
 - D) 0
50. Find the slope of the line whose equation is given by $y = 10$.
- A) 10
 - B) $1/10$
 - C) undefined
 - D) 0
51. Find the x - and y -intercepts of the line whose equation is given by $4x + 6y = 24$.
- A) x -intercept: $(6, 0)$, y -intercept $(0, 4)$
 - B) x -intercept: $(4, 0)$, y -intercept $(0, 6)$
 - C) x -intercept: $(-6, 0)$, y -intercept $(0, -4)$
 - D) x -intercept: $(-4, 0)$, y -intercept $(0, -6)$
52. Find the x - and y -intercept of the line whose equation is given by $y + 5 = -20$.
- A) no x -intercept, y -intercept: $(0, -25)$
 - B) no x -intercept, y -intercept: $(0, 5)$
 - C) no x -intercept, y -intercept: $(0, -20)$
 - D) x -intercept: $(0,0)$, y -intercept: $(0, -25)$
53. Write the equation of the line given the slope $m = 1/12$ and x -intercept $(1/4, 0)$.
- A) $y = \frac{1}{12}x + \frac{1}{4}$
 - B) $y = \frac{1}{12}x - \frac{1}{48}$
 - C) $y = \frac{1}{4}x - \frac{1}{48}$
 - D) $y = \frac{1}{12}x + \frac{1}{48}$

54. Write the equation of the line given the slope $m = -6/5$ and a point $(-11, 3)$ that lies on the line.

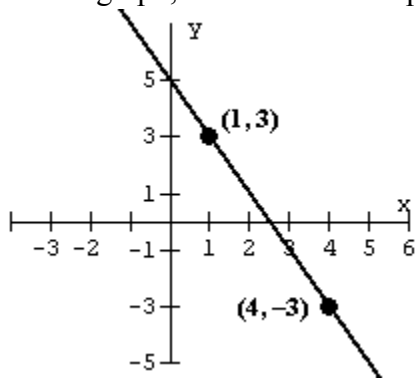
A) $y = -\frac{6}{5}x - 3$

B) $y = -\frac{6}{5}x + \frac{51}{5}$

C) $y = -\frac{6}{5}x - \frac{51}{5}$

D) $y = \frac{6}{5}x - \frac{51}{5}$

55. For the graph, determine the slope.



A) -2

B) 2

C) $1/2$

D) $-1/2$

56. Write an equation that describes the variation.

s varies directly with the square root of x and inversely with n . $s = 370$ when $x = 100$ and $n = 10$.

A) $s = \frac{37x}{n}$

B) $s = \frac{370\sqrt{x}}{n}$

C) $s = \frac{37\sqrt{xn}}{10}$

D) $s = \frac{37x^2}{n}$

57. Write an equation that describes the variation. Use k as the constant of variation.

V varies directly with b^5

A) $V = \frac{k}{b^5}$

B) $V = k b$

C) $V = \frac{k}{b}$

D) $V = k b^5$

58. Write an equation that describes the variation. Use k as the constant of variation.

V varies directly proportional to the square of x

A) $V = k x^2$

B) $V = k x$

C) $V = \frac{k}{x}$

D) $V = \frac{k}{x^2}$

59. Write an equation that describes the variation. Use k as the constant of variation.

f varies inversely proportional to L^2

A) $f = k L$

B) $f = \frac{k}{L}$

C) $f = \frac{k}{L^2}$

D) $f = k L^2$

60. Write an equation that describes the variation. Use k as the constant of variation.

y varies directly with both d^2 and m^5

A) $y = k d m^5$

B) $y = k d^2 m^5$

C) $y = \frac{k d^2}{m^5}$

D) $y = \frac{k}{d^2 m^5}$

61. Write an equation that describes the variation.

P varies directly proportional to the fourth power of z . $P = 1,250$ when $z = 5$

A) $P = \frac{781,250}{z^4}$

B) $P = 250 z$

C) $P = 2 z^4$

D) $P = \frac{6,250}{z}$

62. Write an equation that describes the variation.

y varies inversely proportional to the square of a . $y = 8$ when $a = 4$

A) $y = \frac{128}{a^2}$

B) $y = \frac{32}{a}$

C) $y = 0.5 a^2$

D) $y = 2 a$

63. Write an equation that describes the variation. Use k as the constant of variation.

f varies directly proportional to both a^2 and z . $f = 7$ when $a = 1$ and $z = 7$

A) $f = \frac{z}{a^2}$

B) $f = a z$

C) $f = \frac{49}{a^2 z}$

D) $f = a^2 z$

64. Hooke's Law in physics states that if a spring at rest (equilibrium position) has a weight attached to it, then the distance the spring stretches is directly proportional to the force (weight).

$$F = kx$$

where F is the force in Newtons(N), x is the distance stretched in meters (m), and k is the spring constant (N/m).

A force of 364 N will stretch the spring 28 cm. How far will a force of 468 stretch the spring? Round to two decimal places.

- A) 0.22 m
 - B) 21.78 m
 - C) 0.36 m
 - D) 36 m
65. In physics, the inverse square law states that any physical quantity or strength is inversely proportional to the square of the distance from the source of that physical quantity. In particular, the intensity of light radiating from a point source is inversely proportional to the square of the distance from the source. Below is a table of average distances from the Sun:

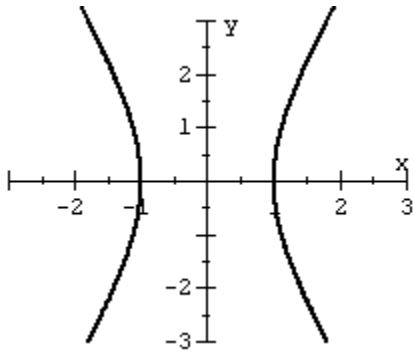
| Planet | Distance to the Sun |
|---------|---------------------|
| Mercury | 58,000 km |
| Earth | 150,000 km |
| Mars | 228,000 km |

The solar radiation on the Earth is approximately 1540 watts per square meter. How much solar radiation is there on Mars? Round to the nearest hundred watts per square meter.

- A) 151,973,684.21 watts per square meter
 - B) 1,013.16 watts per square meter
 - C) 666.55 watts per square meter
 - D) 0.00 watts per square meter
66. Classify the following relationship as a function or not a function.
{(11, 16), (-3, 16), (3, 16), (10, 16)}
- A) a function
 - B) not a function
 - C) cannot be determined

67. Classify the following relationship as a function or not a function.
 $\{(-7, -17), (-7, 14), (-7, -12), (-7, -1)\}$
A) a function
B) not a function
C) cannot be determined
68. Given the function $f(x) = 2x - 1$, evaluate $f(x + 5)$.
A) $2x + 9$
B) $2x - 9$
C) $2x^2 + 9$
D) $2x + 4$
69. Given the function $f(x) = x^2 - 3x + 2$, evaluate $f(x) - f(7)$.
A) $x^2 - 3x + 28$
B) $x^2 - 3x - 30$
C) $x^2 - 3x - 28$
D) $x - 7$
70. Given the function $H(x) = 1 - x^2$, evaluate $H(x - 6)$.
A) $-5 - x^2$
B) $-5 + 12x - x^2$
C) $-35 + 12x - x^2$
D) $-5 - x$
71. Let $f(x) = x(4x - 1)^2 - 14(4x - 1)$ and find the values of x that corresponds to $f(x) = 0$.
A) $\{7/4, -2, 1/4\}$
B) $\{-7/4, 2, 1/4\}$
C) $\{-7/4, 2\}$
D) $\{14, 1/4\}$

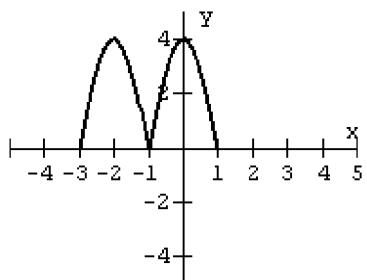
72. Use the vertical line test to determine if the graph below defines a function.



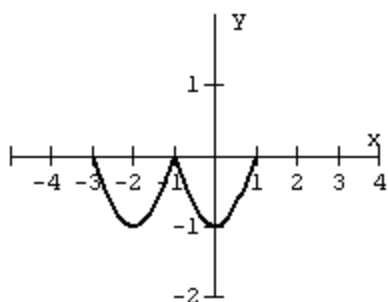
- A) not a function
 - B) a function
 - C) cannot be determined
73. The graph of $y = |x|$ shifted down 10 and to the right 11. Write the resulting function.
- A) $y = |x + 11| - 10$
 - B) $y = |x - 11| - 10$
 - C) $y = |x + 11| + 10$
 - D) $y = |x - 11| + 10$
74. The graph of $y = x^2$ is shifted up 9 and to the left 1. Write the resulting function.
- A) $y = (x - 1)^2 - 9$
 - B) $y = (x - 9)^2 - 1$
 - C) $y = (x + 9)^2 + 1$
 - D) $y = (x + 1)^2 + 9$
75. The graph of $y = |x|$ is reflected about the x -axis and shifted up 7. Write the resulting function.
- A) $y = |x| + 7$
 - B) $y = -|x + 7|$
 - C) $y = -|x| + 7$
 - D) $y = -|x - 7|$

76. The graph of $y = \sqrt{x}$ is reflected about the x -axis and shifted to the left 8. Write the resulting function.
- A) $y = -\sqrt{x} + 8$
 - B) $y = \sqrt{-x+8}$
 - C) $y = -\sqrt{x+8}$
 - D) $y = -\sqrt{x-8}$
77. The graph of $y = \sqrt{x}$ is reflected about the x -axis and shifted to the right 14 and up 7. Write the resulting function.
- A) $y = -\sqrt{x-14} + 7$
 - B) $y = -\sqrt{x+14} + 7$
 - C) $y = -\sqrt{x-7} + 14$
 - D) $y = -\sqrt{x+7} + 14$
78. Write the function that results from shifting $y = x^2 + 3$ to the left 2 and reflecting about the x -axis.
- A) $y = -(x + 2)^2 - 3$
 - B) $y = -(x - 2)^2 - 3$
 - C) $y = -(x + 2)^2 + 3$
 - D) $y = -(x - 2)^2 + 3$
79. Write the function that results from shifting $y = \sqrt{x}$ to the right 8 and up 7.
- A) $y = \sqrt{x+8} + 7$
 - B) $y = \sqrt{x-8} + 7$
 - C) $y = \sqrt{x-8} - 7$
 - D) $y = \sqrt{x-7} + 8$
80. Write the function resulting from shifting $f(x) = 8x^2 + 4$ to the left 5 and up 10.
- A) $y = 8(x + 5)^2 + 14$
 - B) $y = 8(x + 5)^2 + 10$
 - C) $y = 8(x - 5)^2 + 10$
 - D) $y = 8(x - 5)^2 + 14$

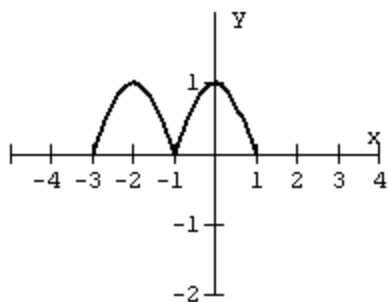
81. For the given graph of a function $f(x)$ draw the indicated function.



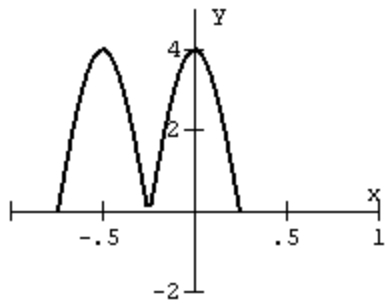
$$y = -\frac{1}{4} f(x)$$



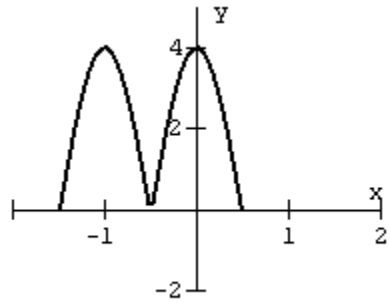
A)



B)

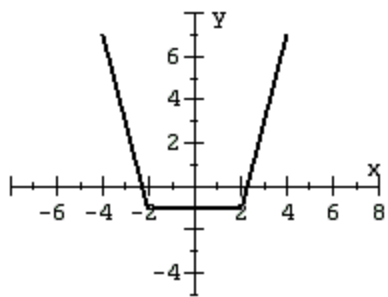


C)

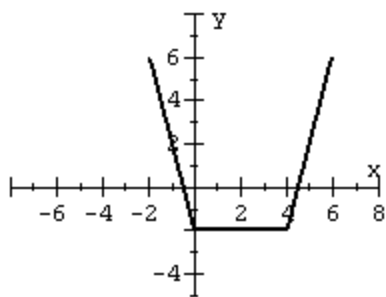


D)

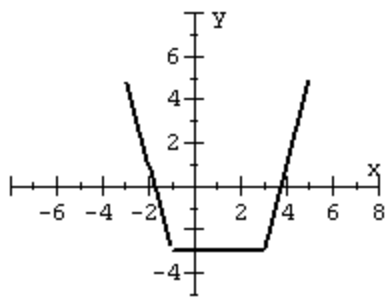
82. For the given graph of a function $f(x)$ draw the indicated function.



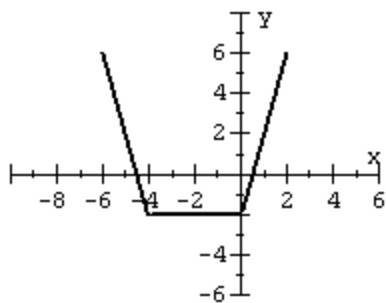
$$y = f(x + 2) - 1$$



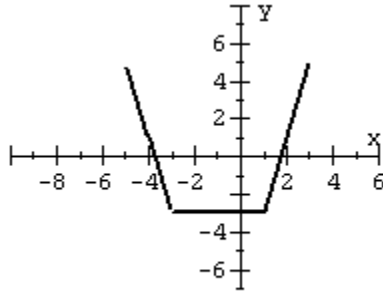
A)



B)



C)



D)

83. Given the functions $f(x) = 2x + 2$ and $g(x) = -9x + 6$, find $(f + g)(x)$.

- A) $-7x + 8$
- B) $-7x + 4$
- C) $11x + 8$
- D) $-18x + 12$

84. Given the functions $f(x) = \frac{x+4}{x-1}$ and $g(x) = \frac{3x-9}{x+3}$, find $(f + g)(x)$.

- A) $\frac{4x-5}{2x+2}$
- B) $\frac{3x^2-36}{(x-1)(x+3)}$
- C) $\frac{4x^2-5x+21}{(x-1)(x+3)}$
- D) $\frac{4x^2-5x+21}{2x+2}$

85. Given the functions $f(x) = 5x^2 + 6x$ and $g(x) = -11x^2 + 11x$, find $(f - g)(x)$.

- A) $16x^2 + 5x$
- B) $16x^2 - 5x$
- C) $-6x^2 - 17x$
- D) $-6x^2 - 5x$

86. Given the equations $f(x) = 5x^2 + 4$ and $g(x) = 4x^2 - 10$, find $(f \cdot g)(x)$.
- A) $20x^4 - 40$
 - B) $20x^4 - 34x^2 - 40$
 - C) $20x^4 + 66x^2 - 40$
 - D) $20x^4 + 40$
87. Given the functions $f(x) = 48x + 64$ and $g(x) = 6x + 8$, find $\left(\frac{f}{g}\right)(x)$.
- A) $288x^2 + 768x + 512$
 - B) $1/8$
 - C) 8
 - D) $54x + 72$
88. Given the equations $f(x) = 10x + 4$ and $g(x) = 10x - 10$, find $(f \circ g)(x)$.
- A) $20x - 6$
 - B) $100x - 100$
 - C) $100x - 96$
 - D) $100x + 100$
89. Given the functions $f(x) = \frac{8}{x+8}$ and $g(x) = \frac{1}{x}$, find $(f \circ g)(x)$.
- A) $\frac{8x}{1+8x}$
 - B) $\frac{8}{1+8x}$
 - C) $\frac{1+8x}{8}$
 - D) $\frac{8}{x^2+8x}$
90. Given the functions $f(x) = 10x + 2$ and $g(x) = 2x - 9$, find $(g \circ f)(x)$.
- A) $20x - 18$
 - B) $20x - 7$
 - C) $20x + 29$
 - D) $20x - 5$

91. Given the functions $f(x) = 2x^2 - 3$ and $g(x) = 3 - 3x$, find $(f \circ g)(3)$.

- A) 69
- B) -75
- C) $-18x^2 - 27$
- D) 285

92. Given the function $f(x) = \frac{9}{1-x}$ and $g(x) = |x|$, find $(f \circ g)\left(\frac{1}{5}\right)$

- A) $-45/4$
- B) $45/4$
- C) $\left|\frac{1}{5}\right|$
- D) $-\frac{1}{5}$

93. Find the vertex of the parabola associated with the quadratic function.

$$y = (x - 16)^2 + 47$$

- A) $(-16, -47)$
- B) $(16, -47)$
- C) $(-16, 47)$
- D) $(16, 47)$

94. Find the vertex of the parabola associated with the quadratic function.

$$y = -(x - 6)^2 + 7$$

- A) $(6, -7)$
- B) $(-6, -7)$
- C) $(6, 7)$
- D) $(-6, 7)$

95. Find all the real zeros (and state their multiplicity) of the polynomial function.

$$y = -4x^6(x + 2)^3(x - 3)^5$$

- A) 0, -2, 3
- B) -2, 3
- C) 0 (multiplicity 6), -2 (multiplicity 3), and 3 (multiplicity 5)
- D) 0 (multiplicity 6), 2 (multiplicity 3), and -3 (multiplicity 5)

96. Find all the real zeros (and state their multiplicity) of the polynomial function.

$$y = x(x - 16)^2(x^2 + 18)$$

- A) 0, 16 (multiplicity 2)
- B) 0, -16, (multiplicity 2)
- C) 1, 16, (multiplicity 2), 18 (multiplicity 2)
- D) 0, 16 (multiplicity 2), $\sqrt{18}$

97. For the polynomial function $f(x) = x^7(x + 14)^2(x - 8)$, determine whether the graph touches or crosses at the x -intercept $(0,0)$.

- A) touches the x -axis at $(0,0)$
- B) crosses the x -axis at $(0,0)$
- C) touches the x -axis at $(8,0)$
- D) neither

98. Use long division to divide the polynomials. Express the answers in the form of $Q(x) =$ and $r(x) =$

$$(x^2 + 13x + 39) \div (x + 9)$$

- A) $Q(x) = x + 4$; $r(x) = 3$
- B) $Q(x) = x + 4$; $r(x) = 0$
- C) $Q(x) = x^2 + 12x + 30$
- D) $Q(x) = x + 4$; $r(x) = -3$

99. Use synthetic division to divide the polynomials. Express the answers in the form of $Q(x) =$ and $r(x) =$

$$(x^2 + 13x + 41) \div (x + 5)$$

- A) $Q(x) = x + 8$; $r(x) = 1$
- B) $Q(x) = x + 8$; $r(x) = 0$
- C) $Q(x) = x^2 + 12x + 36$
- D) $Q(x) = x + 8$; $r(x) = -1$

100. Determine whether the number -7 is a zero of $f(x) = x^3 + 4x^2 - 49x - 196$. If it is, find the other real zeros.

- A) -7 is not a zero.
- B) -7 is a zero and the others are -4 and 7 .
- C) -7 is a zero and the others are 4 and -7 .
- D) -7 is a zero and there are no other real zeros.