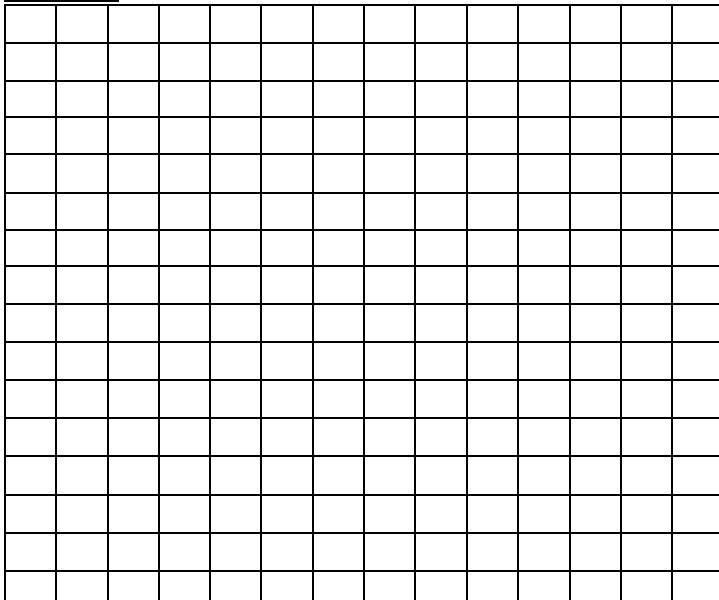| Student Name	Estimated Percentage	Actual MC Score (75)	Actual FR Score (25)	Actual Total Score
Estimate your percentage on this midterm out of 100%. If you are within 3%, you will be given 2 points of extra credit. Note that it is possible to get a total of 85 points (so more than 100%) on the MC section. Each question is worth 1 point.				

Directions: You must show all work in order to receive full credit.

51. Given the rational function, find the domain, vertical asymptotes, holes, zeros, y-intercept, and horizontal asymptote. If any of these do not exist, write "none." Sketch an accurate graph of the function based on all of your findings. You may use a calculator to check the accuracy of your graph.

$$g(x) = \frac{2x^2 - 10x + 12}{x^2 - 4}$$

D	
VA	
Holes	
Zeros	
y-int	
HA	

GRAPH:

HA2PC Midterm Review

The midterm examination will be identical in format to this review. Only the actual numerical values will be different. You will have 85 multiple–choice questions and one free–response problem.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the equation.

1) $10y = 2y + 10 + 7y$

    A) $y = -100$ B) $y = 10$ C) $y = 100$ D) $y = -10$

1) _____

2) $\frac{1}{2}(6x - 8) = \frac{1}{3}(12x - 9)$

    A) $x = 1$ B) $x = -7$ C) $x = -1$ D) $x = \frac{1}{7}$

2) _____

Solve the inequality.

3) $\frac{7x + 8}{11} \geq -1$

    A) $x \geq -\frac{19}{7}$ B) $x \leq -\frac{3}{7}$ C) $x \leq -\frac{19}{7}$ D) $x \geq -\frac{11}{7}$

3) _____

4) $\frac{1}{3}(x + 3) - 3x \leq 3(2 + x)$

    A) $x \geq -\frac{15}{17}$ B) $x \geq \frac{3}{17}$ C) $x \leq \frac{3}{17}$ D) $x \leq -\frac{15}{17}$

4) _____

Find the slope of the line through the pair of points.

5) $(2, 1)$ and $(2, 8)$

    A) 0 B) Undefined   C) $-\frac{7}{4}$ D) $\frac{9}{4}$

5) _____

6) $(2, 7)$ and $(9, 8)$

    A) $\frac{1}{7}$ B) 7 C) $-\frac{1}{7}$ D) $\frac{15}{11}$

6) _____

Find a slope–intercept form equation for the line.

7) Through $(5, 5)$, with slope $-\frac{6}{7}$

    A) $y = -\frac{6}{7}x + \frac{65}{7}$ B) $y = \frac{6}{7}x + \frac{30}{7}$

    C) $y = \frac{6}{7}x - \frac{65}{7}$ D) $y = -\frac{6}{7}x + \frac{30}{7}$

7) _____

1

8) Through the points (2, 4) and (−2, 9)　　　　　　　　　　　　　　　　　8) _____

    A) $y = -\dfrac{5}{2}x + \dfrac{13}{2}$　　　　　　　　　　B) $y = -\dfrac{5}{4}x + \dfrac{13}{2}$

    C) $y = -\dfrac{5}{4}x + \dfrac{13}{4}$　　　　　　　　　　D) $y = -\dfrac{5}{4}x - \dfrac{13}{2}$

Determine the equation of the line described. Put answer in the slope–intercept form, if possible.

9) Through (−6, 1), perpendicular to $-7x + 9y = 51$　　　　　　　　　9) _____

    A) $y = -\dfrac{9}{7}x$　　　　　　　　　　　　B) $y = -\dfrac{9}{7}x - \dfrac{47}{7}$

    C) $y = -\dfrac{7}{9}x - 47$　　　　　　　　　　D) $y = \dfrac{9}{7}x + \dfrac{47}{7}$

10) Through (−3, −4), parallel to $2x + 7y = -48$　　　　　　　　　10) _____

    A) $y = -\dfrac{7}{2}x - 2$　　　　　　　　　　B) $y = \dfrac{2}{7}x + \dfrac{34}{7}$

    C) $y = -\dfrac{2}{7}x - \dfrac{34}{7}$　　　　　　　　D) $y = \dfrac{3}{7}x - \dfrac{48}{7}$

11) Through (8, 6), perpendicular to $x = -3$　　　　　　　　　　　11) _____

    A) $x = -3$　　　　　　B) $y = 6$　　　　　　C) $y = -6$　　　　　　D) $y = -3$

Solve the problem.

12) Suppose the sales of a particular brand of appliance satisfy the relationship $S(x) = 240x + 5800$,　12) _____
where $S(x)$ represents the number of sales in year x, with $x = 0$ corresponding to 1982. Find the
number of sales in 1991.

    A) 15,680　　　　　B) 7960　　　　　C) 15,920　　　　　D) 7720

13) Assume that the sales of a certain appliance dealer are approximated by a linear function.　13) _____
Suppose that sales were \$14,000 in 1982 and \$61,000 in 1987. Let $x = 0$ represent 1982. Find the
equation giving yearly sales $S(x)$.

    A) $S(x) = 47{,}000x + 14{,}000$　　　　　　B) $S(x) = 9400x + 14{,}000$
    C) $S(x) = 9400x + 61{,}000$　　　　　　　D) $S(x) = 47{,}000x + 61{,}000$

Solve the equation by factoring.

14) $x^2 - x = 20$　　　　　　　　　　　　　　　　　　　　　14) _____

    A) $x = 1$ or $x = 20$　　　　　　　　　B) $x = -4$ or $x = 5$
    C) $x = -4$ or $x = -5$　　　　　　　　D) $x = 4$ or $x = 5$

15) $10x^2 + 29x + 1 = -9$　　　　　　　　　　　　　　　　　15) _____

    A) $x = -\dfrac{5}{2}$ or $x = -\dfrac{2}{5}$　　　　　　B) $x = -\dfrac{2}{5}$ or $x = -\dfrac{2}{5}$

    C) $x = \dfrac{2}{5}$ or $x = \dfrac{5}{2}$　　　　　　　D) $x = \dfrac{5}{2}$ or $x = \dfrac{2}{5}$

16) x(2x – 20) = –18　　　　　　　　　　　　　　　　　　　　　　16) _____

    A) x = –1 or x = –9　　　　　　　　B) x = –1 or x = 9

    C) x = 9 or x = 1　　　　　　　　　D) x = –9 or x = 9

Solve the equation using the quadratic formula.

17) $4x^2 + 10x + 1 = 0$　　　　　　　　　　　　　　　　　　17) _____

    A) $x = \dfrac{-5 + \sqrt{21}}{4}$ or $x = \dfrac{-5 - \sqrt{21}}{4}$　　　B) $x = \dfrac{-5 + \sqrt{29}}{4}$ or $x = \dfrac{-5 - \sqrt{29}}{4}$

    C) $x = \dfrac{-10 + \sqrt{21}}{4}$ or $x = \dfrac{-10 - \sqrt{21}}{4}$　　B) $x = \dfrac{-5 + \sqrt{21}}{8}$ or $x = \dfrac{-5 - \sqrt{21}}{8}$

18) $6x^2 = -10x - 2$　　　　　　　　　　　　　　　　　　　18) _____

    A) $x = \dfrac{-5 + \sqrt{13}}{12}$ or $x = \dfrac{-5 - \sqrt{13}}{12}$　　B) $x = \dfrac{-10 + \sqrt{13}}{6}$ or $x = \dfrac{-10 - \sqrt{13}}{6}$

    C) $x = \dfrac{-5 + \sqrt{37}}{6}$ or $x = \dfrac{-5 - \sqrt{37}}{6}$　　D) $x = \dfrac{-5 + \sqrt{13}}{6}$ or $x = \dfrac{-5 - \sqrt{13}}{6}$

Solve the problem.

19) The length of a rectangle is three inches more than the width. The area of the rectangle is 130　　19) _____
    inches. Find the width of the rectangle.

    A) 10 inches　　　　B) 13 inches　　　　C) 7 inches　　　　D) 5 inches

20) The area of a square is numerically 165 more than the perimeter. Find the length of the side.　　20) _____

    A) 113 units　　　　B) 15 units　　　　C) 60 units　　　　D) 450 units

21) A rock falls from a tower that is 432 ft high. As it is falling, its height is given by the formula　　21) _____
    $h = 432 - 16t^2$. How many seconds will it take for the rock to hit the ground (h=0)?

    A) 5.2 s　　　　B) 20.4 s　　　　C) 20.8 s　　　　D) 11,664 s

Write the sum or difference in the standard form a + bi.

22) (5 – 3i) + (7 + 7i)　　　　　　　　　　　　　　　　　　22) _____

    A) 12 + 4i　　　　B) 12 – 4i　　　　C) –12 – 4i　　　　D) –2 + 10i

23) (9 + 6i) – (–7 + i)　　　　　　　　　　　　　　　　　　23) _____

    A) 16 + 5i　　　　B) 2 + 7i　　　　C) –16 – 5i　　　　D) 16 – 5i

Write the product in standard form.

24) 2i(4 – 8i)　　　　　　　　　　　　　　　　　　　　　　24) _____

    A) 16 + 8i　　　　B) 8i – 16　　　　C) $8i - 16i^2$　　　　D) $8i + 16i^2$

25) (4 + 8i)(5 + 9i)　　　　　　　　　　　　　　　　　　　25) _____

    A) 92 + 4i　　　　B) –52 + 76i　　　　C) $72i^2 + 76i + 20$　　　D) –52 – 76i

Write the expression in the form bi, where b is a real number.

26) $\sqrt{-324}$

26) _____

    A) $-i\sqrt{18}$ B) $-18i$ C) $18i$ D) ± 18

27) $-\sqrt{-228}$

27) _____

    A) $-2i\sqrt{57}$ B) $-2\sqrt{57}$ C) $2i\sqrt{57}$ D) $2\sqrt{57}$

Find the real numbers x and y that make the equation true.

28) $3 - 3i = x + yi$

28) _____

    A) $x = 3, y = -3$ B) $x = 3, y = 3$ C) $x = -3, y = -3$ D) $x = -3, y = 3$

Find the product of the complex number and its conjugate.

29) $6 - 3i$

29) _____

    A) 45   B) $36 + 9i$ C) $36 - 9i$ D) 27

Write the expression in standard form.

30) $\dfrac{2 + 3i}{5 + 4i}$

30) _____

    A) $-\dfrac{2}{9} - \dfrac{7}{9}i$ B) $\dfrac{22}{41} + \dfrac{7}{41}i$ C) $\dfrac{22}{9} - \dfrac{7}{9}i$ D) $-\dfrac{2}{41} - \dfrac{23}{41}i$

Solve the equation.

31) $x^2 - 12x + 52 = 0$

31) _____

    A) 10, 2   B) $-6 \pm 4i$ C) $6 \pm 4i$ D) $12 \pm 8i$

Use a method of your choice to solve the equation.

32) $\left| 4x - 7 \right| = 2$

32) _____

    A) $x = \dfrac{5}{4}$ or $x = \dfrac{9}{4}$ B) $x = -\dfrac{7}{4}$ or $x = \dfrac{7}{4}$

    C) $x = -\dfrac{9}{4}$ or $x = \dfrac{9}{4}$ D) $x = 5$ or $x = 9$

33) $\dfrac{x - 3}{x + 4} = 2$

33) _____

    A) $x = 5$ B) $x = -11$ C) $x = -8$ D) $x = -5$

34) $x + 1 - 2\sqrt{x + 7} = 0$

34) _____

    A) $x = 1 + 2\sqrt{7}$ B) $x = -2\sqrt{7}$ or $x = 2\sqrt{7}$

    C) $x = -1 + 2\sqrt{7}$ D) $x = -13$ or $x = 15$

Solve the inequality algebraically. Write the solution in interval notation.

35) $|8x - 1| \geq 9$

    A) $[-1, \frac{5}{4}]$ B) $(-\infty, -\frac{5}{4}] \cup [9, \infty)$

    C) $[\frac{5}{4}, \infty)$ D) $(-\infty, -1] \cup [\frac{5}{4}, \infty)$

35) _____

36) $|3 - 2x| - 3 < 1$

    A) $\left(-\infty, -\frac{1}{2}\right) \cup \left(\frac{7}{2}, \infty\right)$ B) $\left(-\frac{1}{2}, \infty\right)$

    C) $\left(-\frac{1}{2}, \frac{7}{2}\right)$ D) $\left(-\infty, -\frac{1}{2}\right)$

36) _____

Solve the inequality. Use algebra to solve the corresponding equation.

37) $x^2 - 4x - 5 < 0$

    A) $(-\infty, -1)$ B) $(5, \infty)$

    C) $(-1, 5)$ D) $(-\infty, -1) \cup (5, \infty)$

37) _____

38) $x^2 + 5x \geq -4$

    A) $[-4, -1]$ B) $(-\infty, -4] \cup [-1, \infty)$

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

38) _____

39) $x^2 + 8 \leq -2x$

    A) $(-\infty, \infty)$ B) $(-\infty, -2)$ C) No solution   D) $(8, \infty)$

39) _____

Solve the problem.

40) If a rocket is propelled upward from ground level, its height in meters after t seconds is given by $h = -9.8t^2 + 78.4t$. During what interval of time will the rocket be higher than 117.6 m?

    A) $2 < t < 6$ B) $4 < t < 8$ C) $0 < t < 2$ D) $6 < t < 4$

40) _____

Find the domain of the given function.

41) $f(x) = \sqrt{13 - x}$

    A) All real numbers   B) $(-\infty, 13]$

    C) $(\sqrt{13}, \infty)$ D) $(-\infty, 13) \cup (13, \infty)$

41) _____

42) $f(x) = \dfrac{\sqrt{x + 8}}{(x + 1)(x - 9)}$

    A) All real numbers   B) $(-\infty, -8) \cup (-8 -1) \cup (-1, 9) \cup (9, \infty)$

    C) $[-8, -1) \cup (-1, 9) \cup (9, \infty)$ D) $(0, \infty)$

42) _____

Find the range of the function.

43) $f(x) = x^2 + 4$

    A) $(-\infty, \infty)$ B) $(-4, \infty)$ C) $[4, \infty)$ D) $(-\infty, 4]$

43) _____

44) $f(x) = \sqrt{3 + x}$

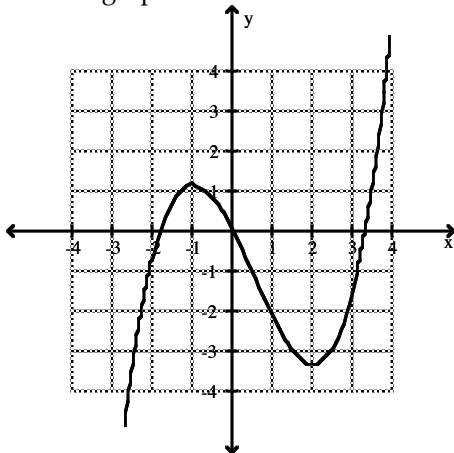   A) $[-3, \infty)$ B) $(-\infty, \infty)$ C) $[0, \infty)$ D) $(0, \infty)$

44) _____

Solve the problem.

45) Use the graph of f to estimate the local maximum and local minimum.

45) _____

    A) No local maximum; no local minimum
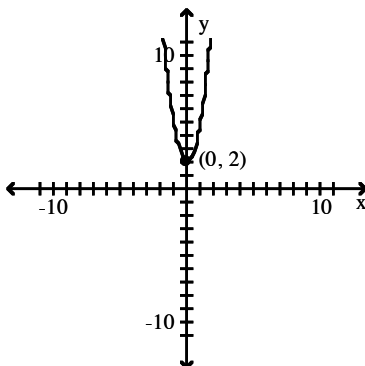   B) Local maximum: ∞; local minimum: $-\infty$
    C) Local maximum: approx. 1.17; local minimum: approx. −3.33
    D) Local maximum: −1; local minimum: 2

Determine the intervals on which the function is increasing, decreasing, and constant.

46)

46) _____

    A) Increasing on $(\infty, 0)$; Decreasing on $(0, -\infty)$
    B) Increasing on $(-\infty, 0)$; Decreasing on $(-\infty, 0)$
    C) Increasing on $(-\infty, 0)$; Decreasing on $(0, \infty)$
    D) Increasing on $(0, \infty)$; Decreasing on $(-\infty, 0)$

Solve the problem.

47) Estimate graphically the local maximum and local minimum of $f(x) = \frac{1}{3}x^3 + x^2 - 3x$.

47) _____

    A) Local maximum: 9; local minimum: −1.67
    B) Local maximum: 8.53; local minimum: −2.01
    C) Local maximum: 9; local minimum: 1.06
    D) Local maximum: 1.67; local minimum: −9

6

Determine algebraically whether the function is even, odd, or neither even nor odd.

48) $f(x) = 4x^2 - 3$

    A) Odd   B) Even   C) Neither

48) _____

49) $f(x) = 3x^5 - 5x^3$

    A) Even   B) Odd   C) Neither

49) _____

Find the asymptote(s) of the given function.

50) $h(x) = \dfrac{(x - 8)(x + 8)}{x^2 - 1}$ vertical asymptotes(s)

    A) x = 1, x = −1   B) None   C) x = 8, x = −8   D) x = −8, x = 8

50) _____

51) $f(x) = \dfrac{x - 9}{x^2 + 9}$ vertical asymptotes(s)

    A) x = 9   B) x = 3, x = −3   C) None   D) x = −9

51) _____

52) $f(x) = \dfrac{6x^2 + 2}{6x^2 - 2}$ horizontal asymptotes(s)

    A) y = 2   B) y = −2   C) None   D) y = 1

52) _____

53) $g(x) = \dfrac{x^2 + 8x - 6}{x - 6}$ horizontal asymptotes(s)

    A) y = −8   B) None   C) y = 6   D) y = 4

53) _____

Graph the function on your calculator to determine the domain and range from the graph.

54) $p(x) = (x - 9)^2$

    A) Domain: [9, ∞); range: (−∞, ∞)   B) Domain: [0, ∞); range: (−∞, ∞)
    C) Domain: (−∞, ∞); range: [0, ∞)   D) Domain: (−∞, ∞); range: [<a>, ∞)

54) _____

55) $f(x) = \dfrac{1}{x} - 9$

    A) Domain: (−∞, ∞); range: (−∞, 0) ∪ (0, ∞)
    B) Domain: (−∞, 0) ∪ (0, ∞); range: (−∞, −9) ∪ (−9, ∞)
    C) Domain: (−∞, ∞); range: (−∞, ∞)
    D) Domain: (−∞, 0) ∪ (0, ∞); range: (−∞, 0) ∪ (0, ∞)

55) _____

Use the Rational Zeros Theorem to write a list of all potential rational zeros

56) $f(x) = 2x^3 - 5x^2 + 7x - 11$

    A) ±1, ±1/11, ±2, ±2/11   B) ±1, ±2, ±11, ±11/2
    C) ±1, ±11, ±1/2, ± 11/2   D) ±1, ±2, ±11

56) _____

Find all rational zeros.

57) $f(x) = x^3 - 3x^2 - 4x + 12$

    A) 2, 3, −2   B) −2, −3, 2   C) −3, −4, 2   D) 3, 4, −2

57) _____

Write an equation for the linear function f satisfying the given conditions.

58) $f(-3) = 8$ and $f(1) = 4$

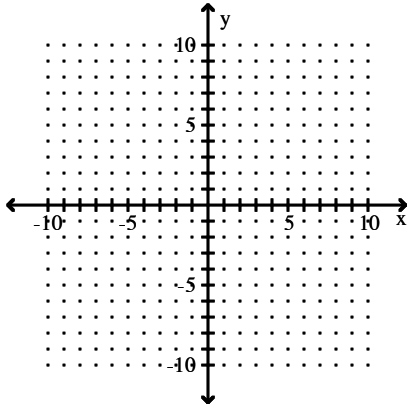A) $f(x) = 3x + 1$ B) $f(x) = -3x - 1$ C) $f(x) = -x + 5$ D) $f(x) = -\dfrac{8}{3}x$
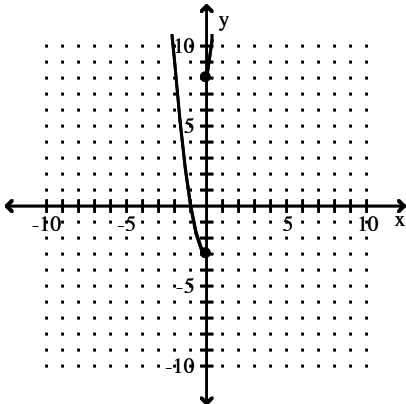
58) _____

Graph the piecewise-defined function.

59)

$$y(x) = \begin{cases} 7x + 8, \text{ if } x < 0 \\ \\ 3x^2 - 3, \text{ if } x \geq 0 \end{cases}$$
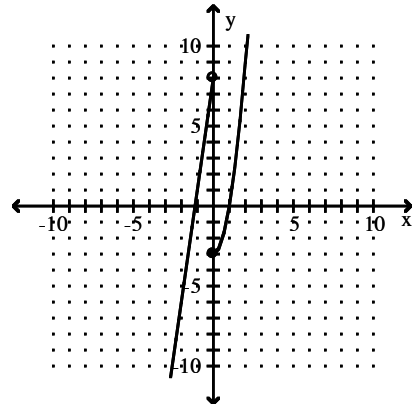
59) _____

A)

B)

C)

D)

8
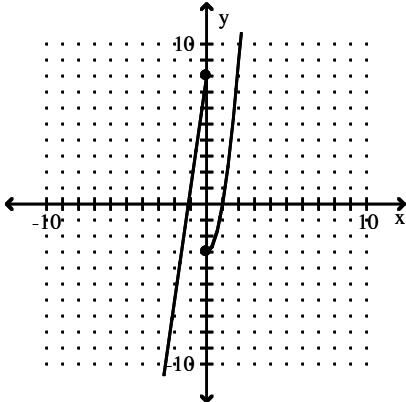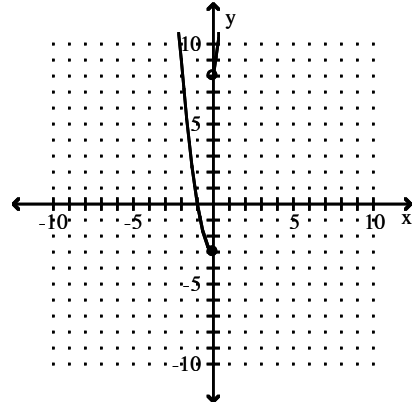
Find the inverse of the function.

60) $f(x) = 2x - 6$ 60) _____

    A) Not a one-to-one function   B) $f^{-1}(x) = \dfrac{x}{2} + 6$

    C) $f^{-1}(x) = \dfrac{x + 6}{2}$ D) $f^{-1}(x) = \dfrac{x - 6}{2}$

61) $f(x) = x^3 - 5$ 61) _____

    A) $f^{-1}(x) = \sqrt[3]{x + 5}$ B) $f^{-1}(x) = \sqrt[3]{x} - 5$

    C) Not a one-to-one function   D) $f^{-1}(x) = \sqrt[3]{x} + 5$

Find the vertex of the graph of the function.

62) $f(x) = (x - 2)^2 + 4$ 62) _____
    A) (0, 2)   B) (2, 4)   C) (4, 2)   D) (4, 0)

63) $f(x) = 3x^2 + 30x + 71$ 63) _____
    A) (-4, -5)   B) (-5, -4)   C) (6, 5)   D) (5, 6)

Write the quadratic function in vertex form.

64) $y = x^2 - 10x + 21$ 64) _____

    A) $y = (x + 5)^2 - 4$ B) $y = (x - 5)^2 - 4$

    C) $y = (x + 5)^2 + 4$ D) $y = (x - 5)^2 + 4$

Write an equation for the quadratic function whose graph contains the given vertex and point.

65) Vertex (5, 3), point (2, 12)   65) _____

    A) $P(x) = 2x^2 - 10x + 28$ B) $P(x) = x^2 - 5x + 3$

    C) $P(x) = -x^2 - 10x + 3$ D) $P(x) = x^2 - 10x + 28$

Find the zeros of the function.

66) $f(x) = 9x^2 + 27x + 20$ 66) _____

    A) $-\dfrac{4}{3}$ and $-\dfrac{5}{3}$ B) $\dfrac{4}{3}$ and $\dfrac{5}{3}$ C) -4 and -5   D) 4 and 5

67) $f(x) = x^3 + 18x^2 + 107x + 210$ 67) _____
    A) 0, 6, 7, and 5   B) -6, -7, and -5   C) -1, -7, and -5   D) 6, 7, and 5

Find the zeros of the polynomial function and state the multiplicity of each.

68) $f(x) = 2(x + 6)^2(x - 6)^3$ 68) _____
    A) 4, multiplicity 1; 6, multiplicity 1; -6, multiplicity 1
    B) -6, multiplicity 3; 6, multiplicity 2
    C) -6, multiplicity 2; 6, multiplicity 3
    D) 4, multiplicity 1; -6, multiplicity 3; 6, multiplicity 3

Solve the problem.

69) The polynomial function $I(t) = -.1t^2 + 1.2t$ represents the yearly income (or loss) from a real estate investment, where t is time in years. After how many years does income begin to decline? Round to the nearest tenth of a year, if necessary.

    A) 8 years   B) 12 years   C) 6 years   D) 5 years

69) _____

Divide f(x) by d(x), and write a summary statement in the form indicated.

70) $f(x) = x^4 + 4x^3 + 5x^2 + 4x + 4$; $d(x) = x^2 + 1$ (Write answer in fractional form)

    A) $\dfrac{f(x)}{(x^2 + 1)} = (x^2 + 4x + 4) + \dfrac{-4}{(x^2 + 1)}$ B) $\dfrac{f(x)}{(x^2 + 1)} = (x^2 - 4x + 4)$

    C) $\dfrac{f(x)}{(x^2 + 1)} = (x^2 + 4x + 4)$ D) $\dfrac{f(x)}{(x^2 + 1)} = (x^2 - 4x + 4) + \dfrac{-4}{(x^2 + 1)}$

70) _____

Divide using synthetic division, and write a summary statement in fraction form.

71) $\dfrac{2x^3 + 3x^2 + 4x - 10}{x + 1}$

    A) $2x^2 + 5x + 9 + \dfrac{1}{x + 1}$ B) $2x^2 + 5x + 9 + \dfrac{-1}{x + 1}$

    C) $2x^2 + x + 3 + \dfrac{-13}{x + 1}$ D) $2x^2 + x + 3 + \dfrac{13}{x + 1}$

71) _____

72) $\dfrac{2x^5 - x^4 + 3x^2 - x + 5}{x - 1}$

    A) $2x^4 + x^3 + 4x^2 + 3x + \dfrac{8}{x + 1}$ B) $2x^4 - 3x^3 + x + \dfrac{6}{x + 1}$

    C) $2x^4 + x^3 + x^2 + 4x + 3 + \dfrac{8}{x + 1}$ D) $2x^4 + x^3 - x^2 + 2x + 1 + \dfrac{6}{x + 1}$

72) _____

Use the graph to guess possible linear factors of f(x). Then completely factor f(x) with the aid of synthetic division.

73) $f(x) = 7x^3 - 39x^2 - 40x + 132$
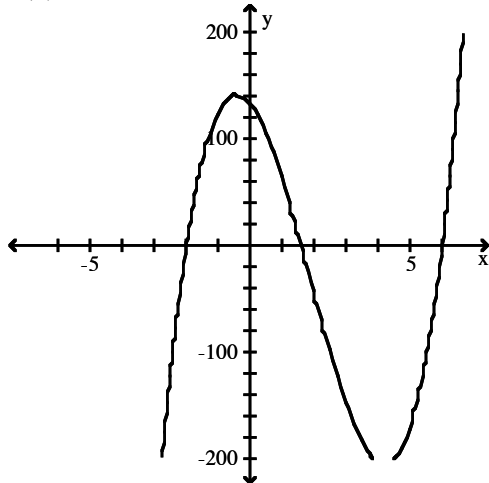
    A) $f(x) = (x - 2)(x + 6)(7x + 11)$ B) $f(x) = (x - 2)(x + 6)(7x + 13)$

    C) $f(x) = (x + 2)(x - 6)(7x - 11)$ D) $f(x) = (x + 2)(x - 6)(7x - 13)$

73) _____

10

State the domain of the rational function.

74) $f(x) = \dfrac{13}{5 - x}$

74) _____

    A) $(-\infty, 5) \cup (5, \infty)$ B) $(-\infty, -13) \cup (-13, 13) \cup (13, \infty)$
    C) $(-\infty, -5) \cup (-5, 5) \cup (5, \infty)$ D) $(-\infty, 13) \cup (13, \infty)$

75) $f(x) = \dfrac{x - 2}{x^2 + 8x}$

75) _____

    A) $(-\infty, -8) \cup (-8, \infty)$ B) $(-\infty, 2) \cup (2, \infty)$
    C) $(-\infty, 8) \cup (8, \infty)$ D) $(-\infty, -8) \cup (-8, 0) \cup (0, \infty)$

Solve the equation.

76) $\dfrac{x + 4}{7} - \dfrac{x - 5}{8} = 2$

76) _____

    A) $x = 61$ B) $x = 115$ C) $x = 45$ D) $x = 179$

77) $\dfrac{-5x^2 - 2}{x - 4} = \dfrac{-15x}{x - 4} + 2$

77) _____

    A) $x = 3$ B) $x = -\dfrac{2}{5}, 3$

    C) $x = \dfrac{2}{5}, -3$ D) $x = \dfrac{-5 \pm \sqrt{185}}{3}$

Solve the polynomial inequality.

78) $(x + 1)(x - 5)(x - 9) > 0$

78) _____

    A) $(-\infty, -1) \cup (5, 9)$ B) $(9, \infty)$
    C) $(-1, 5) \cup (9, \infty)$ D) $(-\infty, 5)$

79) $(x - 3)(x^2 - 3x - 10) < 0$

79) _____

    A) $(-\infty, -2) \cup (3, 5)$ B) $(-\infty, 5)$
    C) $(-2, 3) \cup (5, \infty)$ D) $(-\infty, -2) \cup (3, \infty)$

80) $x^3 + 5x^2 - 9x - 45 \geq 0$

80) _____

    A) $[-3, 3] \cup [5, \infty)$ B) $[-5, \infty)$
    C) $[-5, 3]$ D) $[-5, -3] \cup [3, \infty)$

Describe how the graph of $y = x^2$ can be transformed to the graph of the given equation.

81) $y = (x - 16)^2 + 7$

81) _____

    A) Shift the graph of $y = x^2$ left 16 units and then up 7 units.
    B) Shift the graph of $y = x^2$ left 16 units and then down 7 units.
    C) Shift the graph of $y = x^2$ up 16 units and then right 7 units.
    D) Shift the graph of $y = x^2$ right 16 units and then up 7 units.
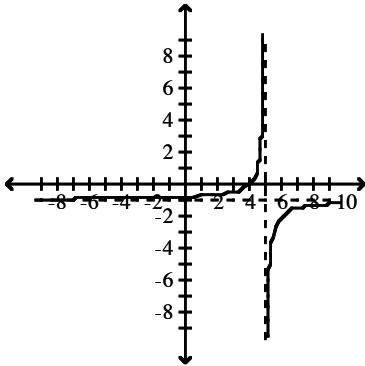
List the x– and y–intercepts, and graph the function.
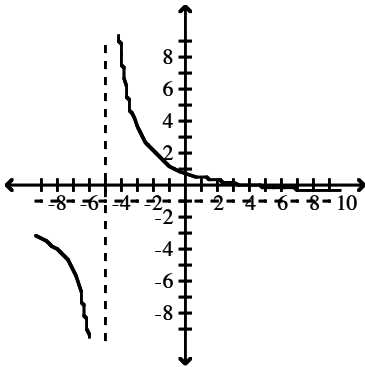
82) $f(x) = \dfrac{x - 4}{x + 5}$

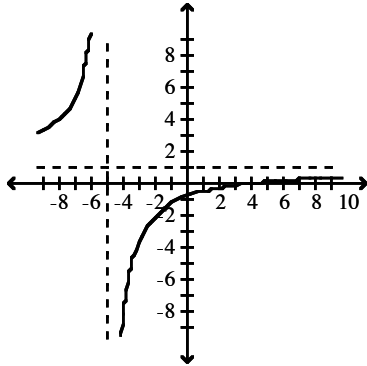A) x-intercept: $(4, 0)$; y-intercept: $\left(0, \dfrac{4}{5}\right)$;
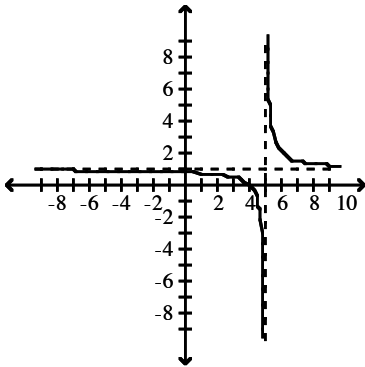
B) x-intercept: $(4, 0)$; y-intercept: $\left(0, -\dfrac{4}{5}\right)$;

C) x-intercept: $(4, 0)$; y-intercept: $\left(0, \dfrac{4}{5}\right)$;

12

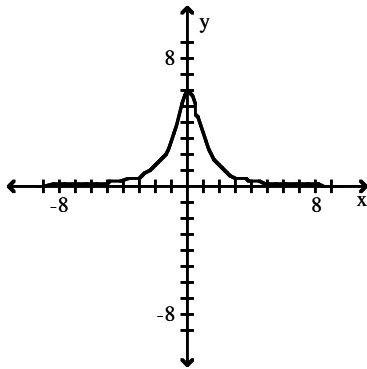D) x–intercept: $(4, 0)$; y–intercept: $\left(0, -\dfrac{4}{5}\right)$;

Match the equation with the appropriate graph.
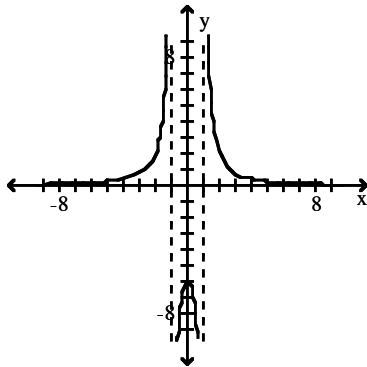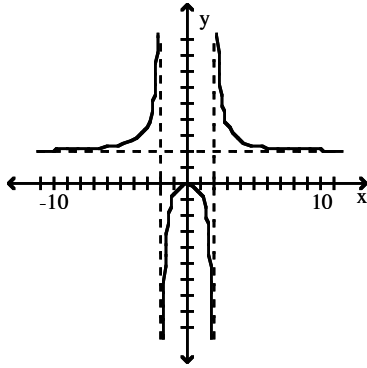
83) $f(x) = \dfrac{6}{x2 - 1}$

A)

B)

C)

D)

83) _____
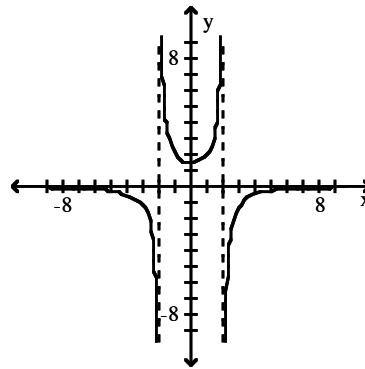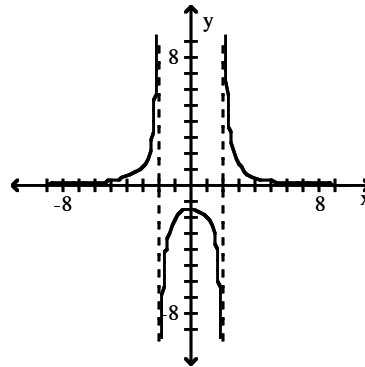
84) $f(x) = \dfrac{2x2}{x2 - 4}$
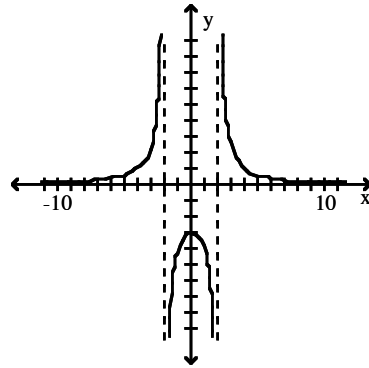
84) _____

A)

B)
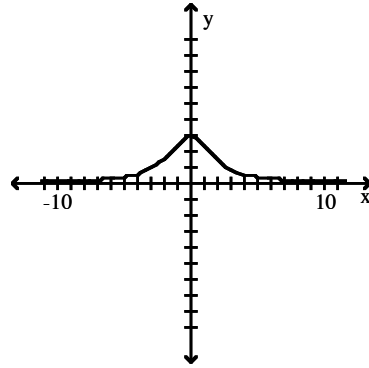
C)
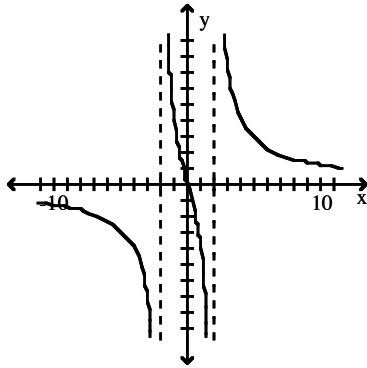
D)

Fill in the blanks to complete the statement.

85) The graph of $y = -\sqrt{x + 5}$ can be obtained from the graph of $y = \sqrt{x}$ by shifting horizontally ? units to the ? and reflecting across the ? –axis.

85) _____

    A) 5; left; y   B) –5; left; x   C) 5; right; x   D) 5; left; x

1) B
2) C
3) A
4) A
5) B
6) A
7) A
8) B
9) B
10) C
11) B
12) B
13) B
14) B
15) A
16) C
17) A
18) D
19) A
20) B
21) A
22) A
23) A
24) A
25) B
26) C
27) A
28) A
29) A
30) B
31) C
32) A
33) B
34) A
35) D
36) C
37) C
38) B
39) C
40) A
41) B
42) C
43) C
44) C
45) C
46) D
47) A
48) B
49) B

50) A
51) C
52) D
53) B
54) C
55) B
56) C
57) A
58) C
59) B
60) C
61) A
62) B
63) B
64) B
65) D
66) A
67) B
68) C
69) C
70) C
71) C
72) C
73) C
74) A
75) D
76) C
77) B
78) C
79) A
80) D
81) D
82) D
83) C
84) A
85) D