ACC GEO CC (MUST SHOW ALL WORK!) Name_____

SPRING EXAM REVIEW #2

Date_____ Period____

1) Given the parent function $f(x) = \sqrt{x}$, what translations occur in the graph of $f(x) = 3\sqrt{x}$

   A) Vertical Stretch by 3

   B) Vertical Compression by $\dfrac{1}{3}$

   C) Horizontal Stretch by 3

   D) Horizontal Compression by $\dfrac{1}{3}$

2) Given the parent function $f(x) = |x|$, what translations occur in the graph of
   $f(x) = -|x - 5|$

   A) Reflection over x, Left 5

   B) Reflection over y, Left 5

   C) Reflection over x, Right 5

   D) Reflection over y, Right 5

Find the inverse of each function.

3) $g(x) = -2 - x^5$

   A) $g^{-1}(x) = \sqrt[5]{-x - 2}$

   B) $g^{-1}(x) = \sqrt[3]{-x - 3}$

   C) $g^{-1}(x) = \dfrac{-6 + \sqrt[3]{4x}}{2}$

   D) $g^{-1}(x) = -2 + (x - 1)^3$

4) $g(x) = \sqrt[5]{x - 1} + 2$

   A) $g^{-1}(x) = -\sqrt[3]{x}$

   B) $g^{-1}(x) = \sqrt[3]{x - 3}$

   C) $g^{-1}(x) = \dfrac{-2 + \sqrt[5]{16x}}{2}$

   D) $g^{-1}(x) = (x - 2)^5 + 1$

5) Determine whether the following function represents an even function, odd function, both an even and odd function, or neither an even or odd function.
   $f(x) = x^2 + 4$

   A) Even   B) Odd

   C) Both   D) Neither

6) Determine whether the following function represents an even function, odd function, both an even and odd function, or neither an even or odd function.
   $f(x) = x^7 - 1$

   A) Even   B) Odd

   C) Both   D) Neither

7) Determine whether the following function represents an even function, odd function, both an even and odd function, or neither an even or odd function.
   $f(x) = x^3 - x$

   A) Even   B) Odd

   C) Both   D) Neither

8) If $f(x)$ passes the vertical line test, then $f(x)$ is

   A) A Function   B) A Relation

   C) Even   D) Odd

9) If $f(x)$ and $g(x)$ are inverses of each other, then their graphs are symmetric to

   _____.

   A) x - axis   B) y - axis

   C) origin   D) y = x

10) If $f(x)$ is Odd, then its graph is symmetric to

   _____.

   A) x - axis   B) y - axis

   C) origin   D) y = x

-1-
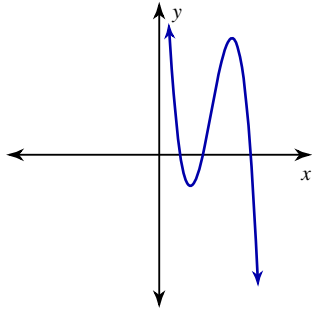
11) If $f(x)$ is Even, then its graph is symmetric to

 _____.

 A) x - axis   B) y - axis
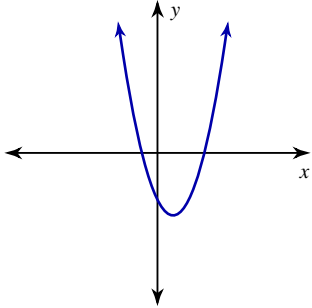 C) origin   D) y = x

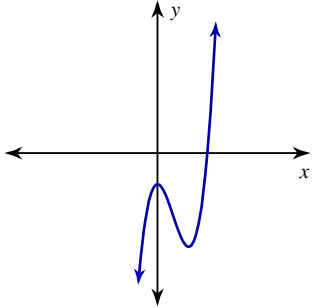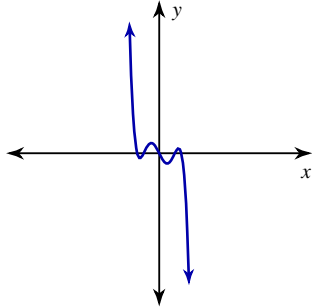**Sketch the general shape of each function.**
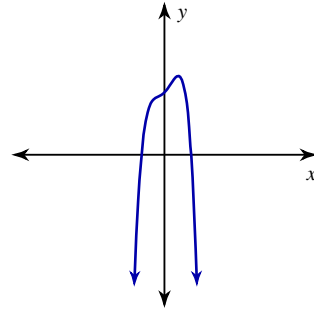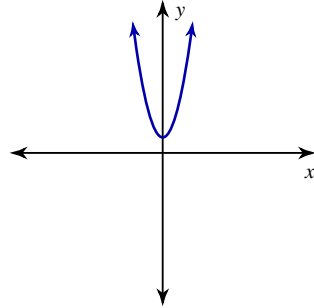
12) $f(x) = x^2 - 2x - 3$

A)

B)
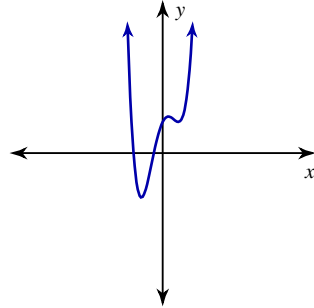

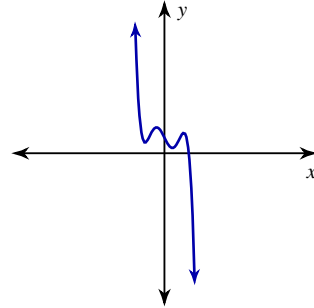C)

D)

13) $f(x) = -x^5 + 3x^3 - 2x + 1$

A)

B)

C)

D)

14) Ther interval(s) for which the function

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

INCREASES are:

A) only $(-\infty, -.22)$
B) only $(-.22, -1.55)$
C) $(-\infty, -.22)$; $(1.55, \infty)$
D) $(-.22, -1.55)$; $(-1.55, -\infty)$

Identify the holes, vertical asymptotes, x-intercepts, horizontal asymptote, and domain of each.

15) $f(x) = \dfrac{2x^2 + 8x + 6}{x^2 + x - 2}$

A) Vertical Asym.: $x = 1$, $x = -2$
   Holes: None
   Horz. Asym.: $y = 0$
   X-intercepts: None
   Domain: All reals except 1, −2
B) Vertical Asym.: $x = -3$, $x = -1$
   Holes: None
   Horz. Asym.: $y = \dfrac{1}{2}$
   X-intercepts: 1, −2
   Domain: All reals except −3, −1
C) Vertical Asym.: $x = 1$, $x = -2$
   Holes: None
   Horz. Asym.: $y = 2$
   X-intercepts: −3, −1
   Domain: All reals except 1, −2
D) Vertical Asym.: $x = -3$, $x = -1$
   Holes: None
   Horz. Asym.: $y = 0$
   X-intercepts: None
   Domain: All reals except −3, −1

16) $f(x) = \dfrac{x^2 - 4x + 3}{4x^2 + 12x}$

A) Vertical Asym.: $x = 0$, $x = -3$
   Holes: None
   Horz. Asym.: $y = \dfrac{1}{4}$
   X-intercepts: 3, 1
   Domain: All reals except 0, −3
B) Vertical Asym.: $x = 3$, $x = 1$
   Holes: None
   Horz. Asym.: $y = 4$
   X-intercepts: 0, −3
   Domain: All reals except 3, 1
C) Vertical Asym.: $x = 0$, $x = -3$
   Holes: None
   Horz. Asym.: $y = 0$
   X-intercepts: None
   Domain: All reals except 0, −3
D) Vertical Asym.: $x = 3$, $x = 1$
   Holes: None
   Horz. Asym.: $y = 0$
   X-intercepts: None
   Domain: All reals except 3, 1

17) $f(x) = \dfrac{x^2 - 3x + 2}{3x^2 - 27}$

   A) Vertical Asym.: $x = 2$, $x = 1$
      Holes: None
      Horz. Asym.: $y = 3$
      X-intercepts: 3, –3
      Domain: All reals except 2, 1

   B) Vertical Asym.: $x = 2$, $x = 1$
      Holes: None
      Horz. Asym.: $y = 0$
      X-intercepts: None
      Domain: All reals except 2, 1

   C) Vertical Asym.: $x = 3$, $x = -3$
      Holes: None

      Horz. Asym.: $y = \dfrac{1}{3}$

      X-intercepts: 2, 1
      Domain: All reals except 3, –3

   D) Vertical Asym.: $x = 3$, $x = -3$
      Holes: None
      Horz. Asym.: $y = 0$
      X-intercepts: None
      Domain: All reals except 3, –3

18) $f(x) = \dfrac{-4x + 16}{x^2 - 7x + 12}$

   A) Vertical Asym.: None
      Holes: $x = 4$
      Horz. Asym.: None
      X-intercepts: 3
      Domain: All reals except 4

   B) Vertical Asym.: $x = 3$
      Holes: $x = 4$
      Horz. Asym.: $y = 0$
      X-intercepts: None
      Domain: All reals except 3, 4

   C) Vertical Asym.: $x = 4$, $x = 3$
      Holes: None
      Horz. Asym.: $y = 0$
      X-intercepts: None
      Domain: All reals except 4, 3

   D) Vertical Asym.: $x = 4$
      Holes: None
      Horz. Asym.: $y = 0$
      X-intercepts: None
      Domain: All reals except 4

Find all zeros.

19) $f(x) = 2x^3 + 3x^2 - 1$

   A) $\left\{ \dfrac{1}{4}, -1 \text{ mult. } 2 \right\}$

   B) $\left\{ 0 \text{ mult. } 2, \dfrac{1}{2} \right\}$

   C) $\left\{ \dfrac{1}{2}, -\dfrac{1}{2} \text{ mult. } 2 \right\}$

   D) $\left\{ \dfrac{1}{2}, -1 \text{ mult. } 2 \right\}$

20) $f(x) = 2x^3 + x^2 - 2x - 1$

   A) $\left\{ \dfrac{1}{3}, -\dfrac{1}{2}, -1 \right\}$

   B) $\left\{ 0, 1, -1 \right\}$

   C) $\left\{ -1 \text{ mult. } 2, -\dfrac{1}{2} \right\}$

   D) $\left\{ 1, -\dfrac{1}{2}, -1 \right\}$

21) $f(x) = 2x^2 + 3x - 2$

   A) $\left\{ \dfrac{1}{2}, -2 \right\}$ B) $\left\{ \dfrac{1}{3}, -2 \right\}$

   C) $\left\{ \dfrac{1}{4}, -2 \right\}$ D) $\left\{ -\dfrac{3}{2}, -2 \right\}$

22) $f(x) = x^2 - 10x - 6$

   A) $\left\{ \dfrac{-11 + \sqrt{145}}{2}, \dfrac{-11 - \sqrt{145}}{2} \right\}$

   B) $\left\{ 5 + \sqrt{21}, 5 - \sqrt{21} \right\}$

   C) $\left\{ \dfrac{5 + \sqrt{37}}{2}, \dfrac{5 - \sqrt{37}}{2} \right\}$

   D) $\left\{ 5 + \sqrt{31}, 5 - \sqrt{31} \right\}$

Find the degree of the polynomial

23) $f(x) = 5x^3 + x^2 - 5x - 1$

   A) 5   B) 3
   C) 4   D) 2

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

   A) 3   B) 6
   C) 4   D) 5

25) Which of the following is NOT a factor of the polynomial
$x^3 + 2x^2 - 5x - 6$

   A) x + 3   B) x - 2
   C) x + 1   D) x - 3

Expand each logarithm.

26) $\log_4 \left(10 \cdot 7 \cdot 11^6\right)$

   A) $6\log_4 11 + \dfrac{\log_4 10}{2}$

   B) $30\log_4 10 + 5\log_4 7$

   C) $30\log_4 10 - 5\log_4 7$

   D) $\log_4 10 + \log_4 7 + 6\log_4 11$

27) $\log_6 \left(\dfrac{x}{y^4}\right)^5$

   A) $\log_6 z + \dfrac{\log_6 x}{3} + \dfrac{\log_6 y}{3}$

   B) $\log_6 x + \log_6 y + 4\log_6 z$

   C) $5\log_6 x - 20\log_6 y$

   D) $4\log_6 z + \dfrac{\log_6 x}{3}$

Condense each expression to a single logarithm.

28) $10\log_5 a - 2\log_5 b$

   A) $\log_5 \left(c^5 \sqrt{a}\right)$

   B) $\log_5 \left(c\sqrt{ba}\right)$

   C) $\log_5 \dfrac{a^2}{b^{10}}$

   D) $\log_5 \dfrac{a^{10}}{b^2}$

29) $3\log_3 w + \dfrac{\log_3 u}{2}$

   A) $\log_3 \left(v^4 u^3\right)$

   B) $\log_3 \left(v^4 u^{12}\right)$

   C) $\log_3 \sqrt{wvu}$

   D) $\log_3 \left(w^3 \sqrt{u}\right)$

Evaluate each expression.

30) $\log_6 216$

   A) 3   B) −2
   C) 36   D) −3

31) $\log_6 1$

   A) 2   B) $\dfrac{1}{6}$

   C) 0   D) −3

32) $\log_2 16$

   A) −4   B) 8

   C) 4   D) 3

33) $\log_2 \dfrac{1}{8}$

   A) 3   B) −3

   C) $\dfrac{1}{16}$ D) 6

Use a calculator to approximate each to the nearest thousandth.

34) $\log_2 4$

   A) 1.247   B) 2.712

   C) 2   D) 1.619

35) $\log_5 6.3$

   A) 1.542   B) 0.765

   C) 1.337   D) 1.144

Solve each equation.

36) $64^{-3v} = 8^{3v+1}$

   A) $\left\{-\dfrac{3}{5}\right\}$ B) $\{6\}$

   C) $\{1\}$ D) $\left\{-\dfrac{1}{9}\right\}$

37) $243^{-2b} = 9^{3b}$

   A) $\left\{\dfrac{9}{5}\right\}$ B) $\{-9\}$

   C) $\left\{-\dfrac{2}{3}\right\}$ D) $\{0\}$

38) $2^{-n-3} = \dfrac{1}{32}$

   A) $\{0\}$ B) $\left\{-\dfrac{5}{7}\right\}$

   C) $\{2\}$ D) $\left\{\dfrac{5}{3}\right\}$

39) $3^{-3x} = 3^{2x-2}$

   A) $\left\{\dfrac{2}{5}\right\}$ B) $\{4\}$

   C) $\left\{\dfrac{1}{6}\right\}$ D) $\{-1\}$

40) Solve $\log_2 2^7 = x$

   A) 0   B) 1

   C) 2   D) 7

41) Solve $3^{\log_3 5} = x$

   A) 1   B) 3

   C) 5   D) 0

Find the 52nd term.

42) −14, −17, −20, −23, ...

   A) $a_{52} = 137$ B) $a_{52} = 136$

   C) $a_{52} = -170$ D) $a_{52} = -167$

43) 11, 6, 1, −4, ...

   A) $a_{52} = -145$ B) $a_{52} = -244$

   C) $a_{52} = -246$ D) $a_{52} = -247$

Find the 8th term.

44) 3, 15, 75, 375, ...

   A) $a_8 = \dfrac{384}{5}$ B) $a_8 = 234375$

   C) $a_8 = 46875$ D) $a_8 = -46875$

45) $-2, -10, -50, -250, ...$

  A) $a_8 = -156250$

  B) $a_8 = -31250$

  C) $a_8 = \dfrac{256}{5}$

  D) $a_8 = -\dfrac{4374}{5}$

Evaluate the related series of each sequence.

46) $-12, -17, -22, -27$

  A) -276 B) -138

  C) -69 D) -78

47) $14, 23, 32, 41, 50, 59, 68$

  A) 582 B) 1148

  C) 287 D) 574

Evaluate each geometric series described.

48) $-1 - 5 - 25 - 125..., \; n = 9$

  A) -660279 B) $\dfrac{1}{4}$

  C) -488281 D) -560925

49) $-1 - 5 - 25 - 125..., \; n = 6$

  A) -3687 B) $\dfrac{1}{4}$

  C) -3224 D) -3906

Given two terms in an arithmetic sequence find the explicit formula.

50) $a_{13} = 33$ and $a_{34} = 96$

  A) $a_n = -5 + 2n$

  B) $a_n = -9 + 4n$

  C) $a_n = -7 + 2n$

  D) $a_n = -6 + 3n$

51) $a_{13} = -111$ and $a_{34} = -321$

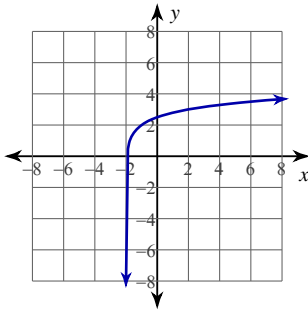 A) $a_n = 19 - 10n$

  B) $a_n = 17 - 9n$

  C) $a_n = 21 - 10n$

  D) $a_n = 18 - 9n$

Identify the domain and range of each. Then sketch the graph.
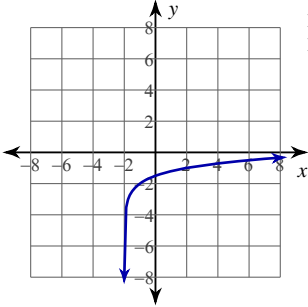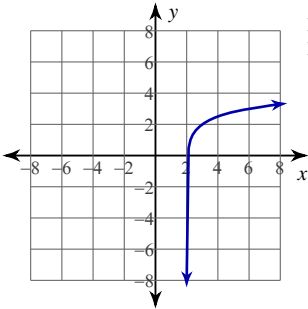
52) $y = \log_4 (x - 2) - 2$

A)

Domain: $x > -2$
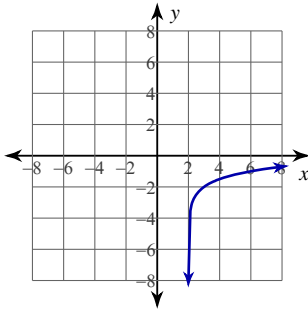Range: All reals

B)

Domain: $x > -2$
Range: All reals

C)

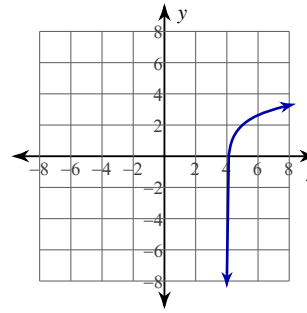
Domain: $x > 2$
Range: All reals

D)

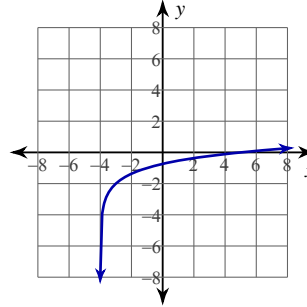Domain: $x > 2$
Range: All reals

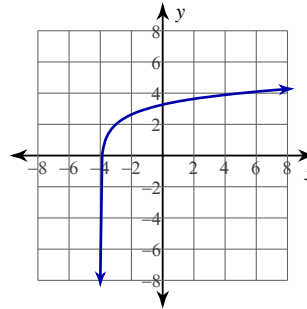53) $y = \log_3 (x + 4) - 2$
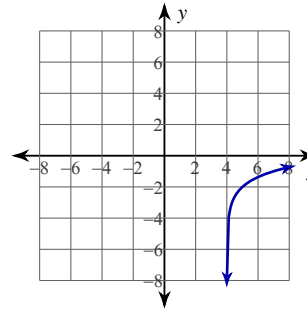
A)

Domain: $x > 4$
Range: All reals

B)

Domain: $x > -4$
Range: All reals

C)

Domain: $x > -4$
Range: All reals

D)

Domain: $x > 4$
Range: All reals

Simplify each expression.

54) $(5n^2 + 3) - (2n^2 + 4 + n^4)$

  A) $-n^4 + 3n^2 - 1$
  B) $-n^4 + n^2 - 1$
  C) $-6n^4 - 5n^2 - 1$
  D) $-n^4 - 5n^2 - 1$

55) $(7x^4 - 2x) - (3x + 8x^2 + 5x^4)$

  A) $-8x^2 - 5x$
  B) $-13x^2 - 5x$
  C) $2x^4 - 8x^2 - 5x$
  D) $-9x^2 - 5x$

Divide.

56) $(9k^3 + 97k^2 + 77k + 72) \div (k + 10)$

   A) $9k^2 + 7k + 6 + \dfrac{5}{k + 10}$

   B) $9k^2 + 7k + 7 + \dfrac{2}{k + 10}$

   C) $9k^2 + 7k + 8 + \dfrac{6}{k + 10}$

   D) $9k^2 + 7k + 6 - \dfrac{3}{k + 10}$

57) $(a^3 - 2a^2 - 79a - 19) \div (a - 10)$

   A) $a^2 + 8a + 1 - \dfrac{10}{a - 10}$

   B) $a^2 + 8a + 4 - \dfrac{8}{a - 10}$

   C) $a^2 + 8a + 4 - \dfrac{14}{a - 10}$

   D) $a^2 + 8a + 1 - \dfrac{9}{a - 10}$

58) Find the Leading Coefficient of
   (3x + 2)(5x - 3).

   A) 1   B) 8

   C) -6   D) 15

Answers to SPRING EXAM REVIEW #2

1) A	2) C	3) A	4) D
5) A	6) D	7) B	8) A
9) D	10) C	11) B	12) B
13) D	14) C	15) C	16) A
17) C	18) B	19) D	20) D
21) A	22) D	23) B	24) C
25) D	26) D	27) C	28) D
29) D	30) A	31) C	32) C
33) B	34) C	35) D	36) D
37) D	38) C	39) A	40) D
41) C	42) D	43) B	44) B
45) A	46) D	47) C	48) C
49) D	50) D	51) A	52) D
53) B	54) A	55) C	56) B
57) D	58) D		