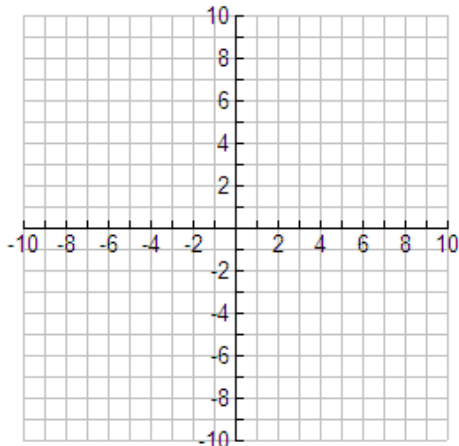


ALL PROBLEMS ARE NON CALC UNLESS NOTED OTHERWISE.

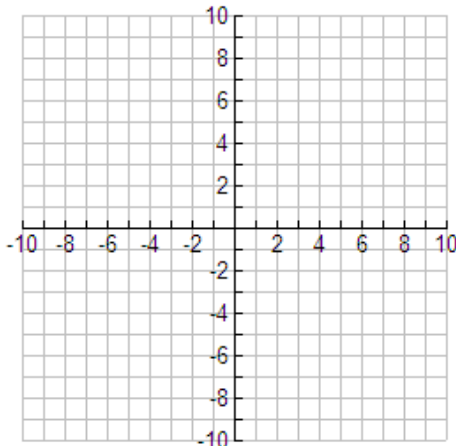
Functions and Transformations

Graph the following parent functions.

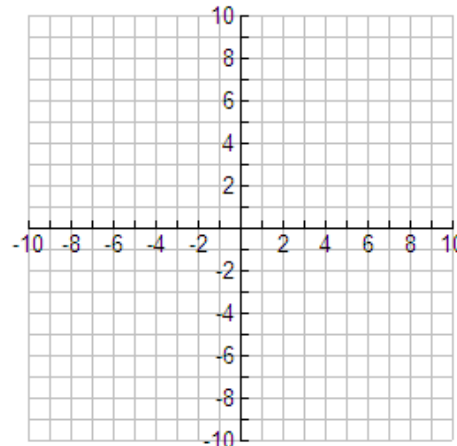
1. $y = x$



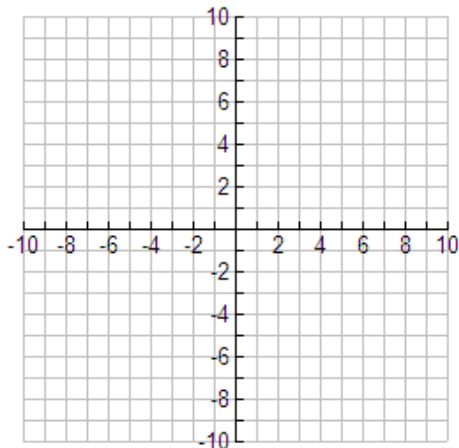
2. $y = |x|$



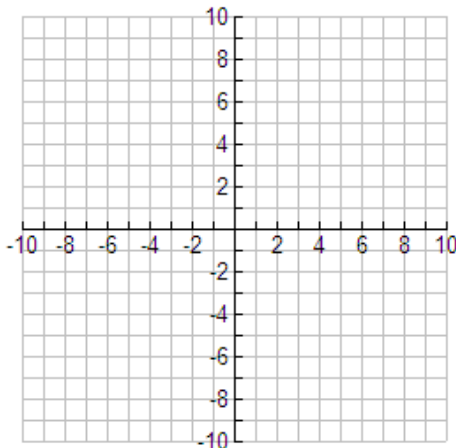
3. $y = x^2$



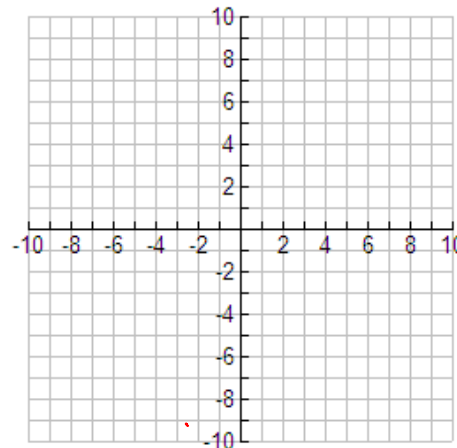
4. $y = \sqrt{x}$



5. $y = 2^x$



6. $y = x^3$



7. Find $f(-3)$ for each of the following situations:

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

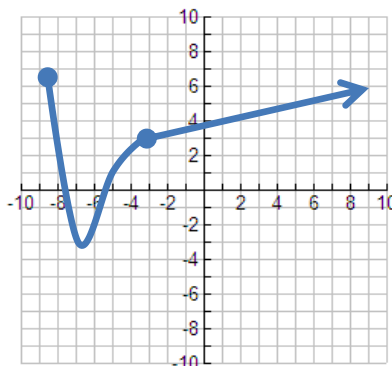
b. $f(x) = |-5 - x|$

c. $f(x) = (x - 1)^3$

d.

x	f(x)
-4	15
-3	10
-2	7
6	-3

e.



8. Solve $f(x) = 2$ in each of the following situations.

a. $f(x) = 20x + 16$

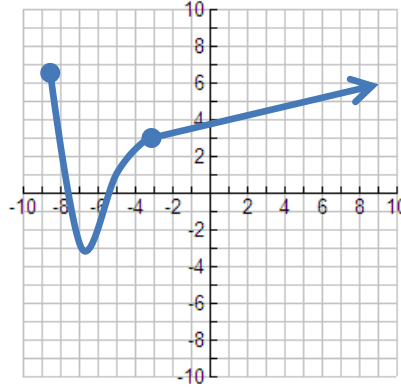
b. $f(x) = -3(x + 6)$

c. $f(x) = |x + 1|$ (Hint: 2 solutions!)

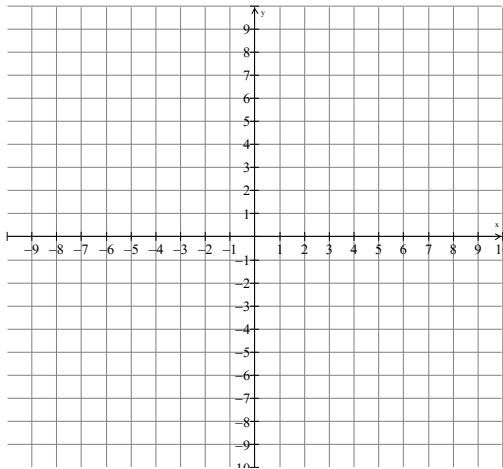
d.

x	f(x)
-4	2
-3	10
2	7
6	-3

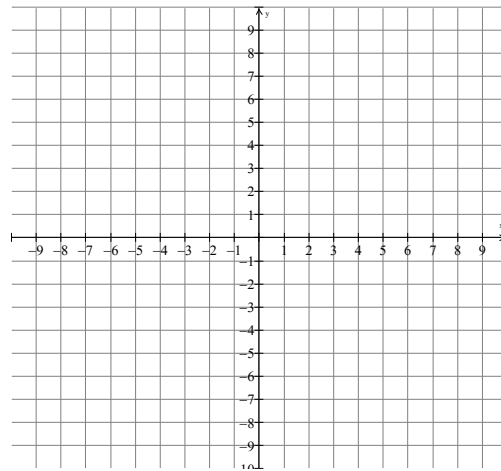
e.



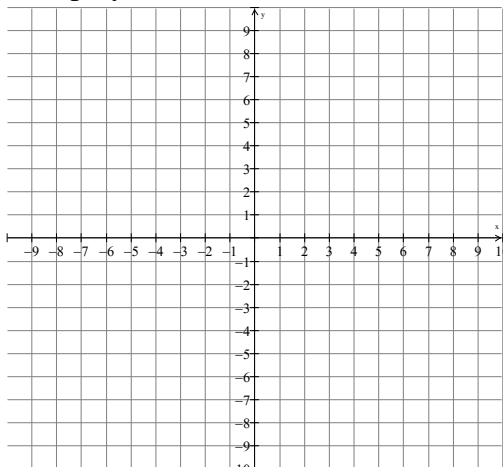
9. Graph $y = -x^2$



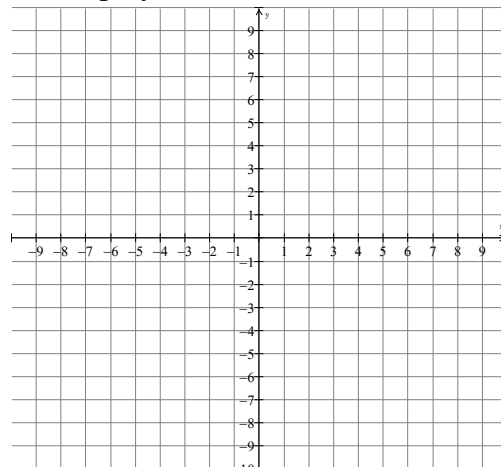
10. Graph $y = |x - 2| - 4$



11. Graph $y = 2|x + 4| + 3$



12. Graph $y = (-x + 3)^3$



Chapters 1 and 3 (Intersection Unit)

1) Solve for x and graph if x-axis is given (be able to do these algebraically and using a graphing calculator).

a) $|2 - 3x| = 4$

Algebra

Graphing Calculator

b) $2 - 5x \geq 2(1 - x)$

Algebra

Graphing Calculator



c) $|4x + 7| \leq 2$

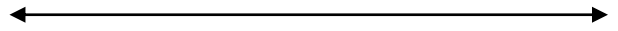
Algebra

Graphing Calculator

d) $|3x - 1| \geq 5$

Algebra

Graphing Calculator



Solve the systems below by using the intersect feature on your calculator.

2)
$$\begin{cases} y = \frac{8}{7}x + 13 \\ y = \frac{7}{8}x - 13 \end{cases}$$

3)
$$\begin{cases} 3x + y = x^2 - 7 \\ y = 3x - 5 \end{cases}$$

Solve the system:

4)
$$\begin{cases} 2x - 5y = -1 \\ x = 5 - 3y \end{cases}$$

5)
$$\begin{cases} 4x - 3y = 5 \\ 3x + 2y = -9 \end{cases}$$

Solve the following systems of 3 linear inequalities. *Hint: look for the easiest variable to solve first* 😊

6. $3x - 2y + z = -2$

$-4x - y = -10$

$8x + 1 = 17$

7. $x + 2y - 3z = -25$

$5x - 2z = -39$

$x - z = -15$

Solve the system.

8) $4x^2 - 2y = 6$

$4x - y = 3$

8 _____

9) $x^2 + y^2 = 25$

$y = x + 7$

9 _____

Chapter 5

1) Find the vertex of each parabola.

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

b) $y = 2x^2 - 8x + 3$

2) Find the x-intercepts.

a) $y = x^2 - 2x - 24$ (factor).

b) $y = -2x^2 - x + 4$ (quadratic formula)

c) $y = 4x^2 + 4x - 3$ (find the zeros using intersect on your calculator)

3) Write an equation of the quadratic with the following zeros.

the zeros are $x = 5$ and $x = -2$

4) Solve for x: $2x(x - 4)(2x + 5) = 0$

5) Simplify.

a) i^2

b) $\sqrt{-25}$

c) $(2 - i) - (3i + 4)$

d) $(2 - 5i)(4 + 7i)$

6) Find the discriminant to determine number and type of solutions.

a) $y = 2x^2 - 3x + 4$

b) $y = x^2 - 8x - 2$

c) $y = x^2 - 4x + 4$

7) Factor.

a) $x^2 + 2x - 15$

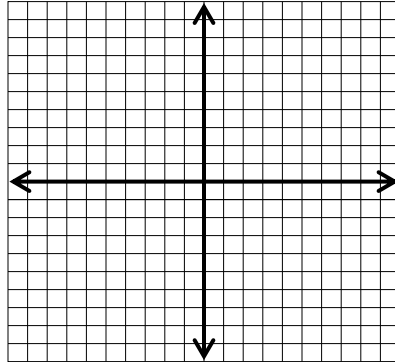
b) $2x^2 + 3x - 9$

c) $8x^2 - 50$

d) $x^2 + 4$

e) $x^3 + 64$

- 8) Given the parabola: $y = -x^2 - 2x + 8$
- a) Find the vertex. b) Find the axis of symmetry. c) Find the y-intercept.
- d) Find the x-intercepts. e) Sketch a graph. f) Find the domain and range.



- 9) Sally throws a baseball straight up with a velocity of 56 feet per second while standing on a platform that is 4 feet off the ground. Use the formula: $h = -16t^2 + vt + h_0$ **CALC OKAY**
- a) What is the maximum height? b) How long is the flight?

Chapter 6

Simplify. Assume that no variable equals 0.

1. $x^5 \cdot x^4 \cdot x$

2. $(-2t^2)^3$

3. $(2x)^2(4y)^2$

4. $\frac{-6a^4bc^8}{36a^7b^2c}$

5. $\frac{-27x^3(-x^7)}{16x^4}$

6. $\left(\frac{2x^3y^2}{-x^2y^5}\right)^{-2}$

Simplify.

7. $(5m^2 - 2mp - 6p^2) - (-3m^2 + 5mp + p^2)$

8. $5a^2w^3(a^2w^6 - 3a^4w^2 + 9aw^6)$

9. $(2n^4 - 3)(2n^4 + 3)$

10. $(w + 2s)(w^2 - 2ws + 4s^2)$

11. $\frac{12x^2y^2 - 4xy^2 - 8xy}{4x}$

12. $(x^3 + 4x^2 - 1) \div (x + 3)$ {use synthetic division!}

Hint: remember to fill in missing placeholders ☺

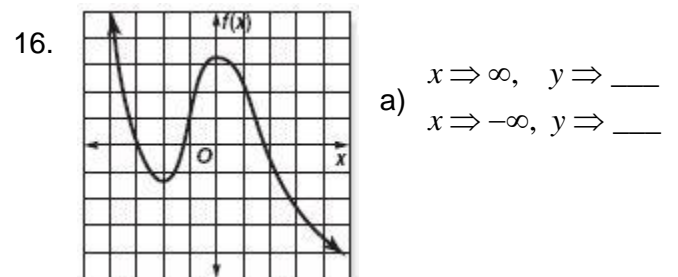
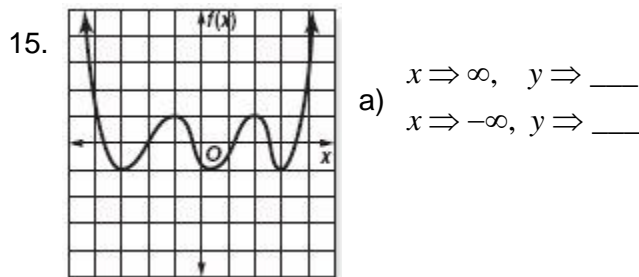
13. Divide: $\frac{(6x^3 - 5x^2 + 10x - 3)}{(3x - 1)}$

14. Use synthetic substitution to find $f(2)$ if

$$f(x) = 6x^3 - x^2 - 14x + 5$$

For each graph:

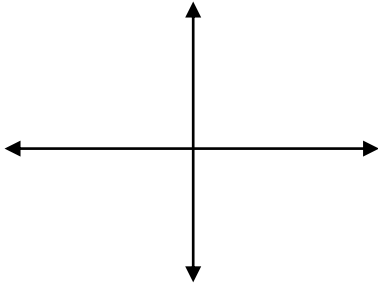
- a. describe the end behavior,
- b. determine whether it represents an odd-degree or an even-degree polynomial function, and
- c. state the number of real zeroes.



16a) Basic Graph Analysis (using the graphing calculator round to 2 decimal places).

- Sketch the graph of the function.
- Find relative max/min values and label these on the graph.
- Give intervals of x-values where $f(x)$ is increasing/decreasing.

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



Factor completely. If the polynomial is not factorable, write prime. (only 2 are prime!)

17. $7x^2 - 14x$

18. $19x^3 - 38x^2$

19. $21x^3 - 18x^2y + 24xy^2$

20. $8j^3k - 4jk^3 + 2j$

21. $a^2 + 7a - 18$

22. $x^4 - 7x^2 + 12$

23. $d^2 - 12d + 36$

24. $3z^2 - z - 10$

25. $4f^2 - 64$

Solve each equation over the set of complex numbers.

26. $a^3 - 9a^2 + 14a = 0$

27. $x^3 - 8$

28. $t^4 - 3t^3 - 40t^2 = 0$

29. $f(x) = x^3 + 2x^2 - 8x - 16$ (calc okay)

30. Given a polynomial and one of its factors, find the remaining factors.

$2x^3 - 7x^2 - 21x + 54$, $(x + 3)$

Chapter 7 - Radical Equations

1) For $f(x) = x^2 - 3x + 6$ and $g(x) = 3x + 5$

a) Find $(f + g)(x)$

b) Find $(f - g)(x)$

c) Find $(f \cdot g)(x)$

d) Find $\left(\frac{f}{g}\right)(x)$

2) For $g(x) = 4x - 1$ and $f(x) = x^2 + 6x + 3$

a) Find $[g \circ f](x)$

b) Find $[f \circ g](x)$

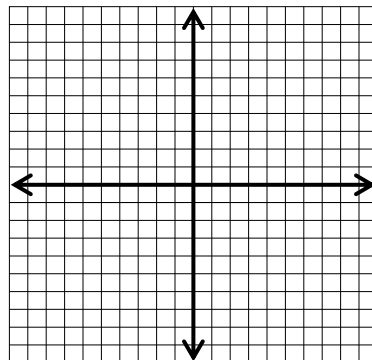
3) If $f(x) = 4x$, $g(x) = -2x + 3$ and $h(x) = x^2 + 1$, find the value of each.

a) $[f \circ (g \circ h)](2)$

4) Find the inverse of each function. Then graph the function and its inverse.

a) $f(x) = 2x + 3$

inverse _____



5) Determine whether each pair of functions are inverse functions.

a) $f(x) = 2x + 6$

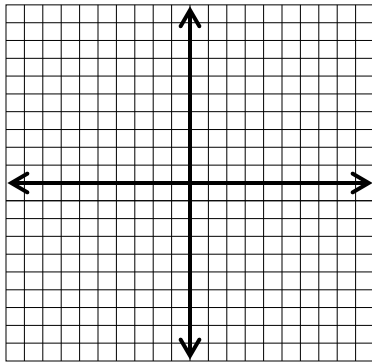
$g(x) = \frac{1}{2}x - 3$

b) $f(x) = \frac{2}{5}x + 10$

$g(x) = \frac{5}{2}x - 5$

6) Graph each function. State the domain and range if the function.

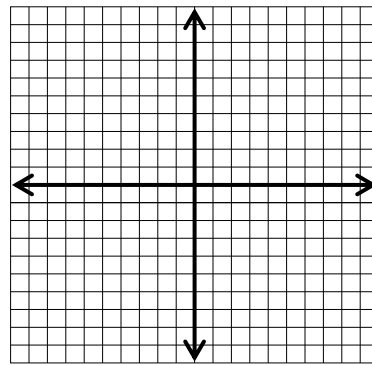
a) $y = \sqrt{x+5} - 4$



Domain _____

Range _____

b) $y = -2\sqrt{x+5}$



Domain _____

Range _____

7) Simplify.

a) $\sqrt[3]{-125x^{12}y^5}$

b) $\sqrt[4]{16a^{16}b^8}$

c) $-4\sqrt{8} + 3\sqrt{32} - \sqrt[3]{81}$

d) $6\sqrt{15} \cdot 5\sqrt{20}$

e) $(\sqrt{3} - \sqrt{10})(2\sqrt{3} + \sqrt{5})$

f) $\sqrt[4]{\frac{81}{16a^8}}$

8) Write in radical form: $5^{\frac{3}{2}}$

9) Write using rational exponents: $\sqrt{21}$

10) Evaluate each expression.

a) $27^{\frac{2}{3}}$

b) $\frac{27^{-\frac{1}{3}}}{16^{-\frac{1}{4}}}$

c) $-9^{\frac{3}{2}}$

11) Simplify each expression.

a) $y^{\frac{3}{2}} \cdot y^{\frac{7}{3}}$

b) $\left(x^{\frac{7}{2}}\right)^{\frac{5}{3}}$

c) $\sqrt{8} \cdot 3\sqrt{25}$

d) $\sqrt[3]{32x^3}$

12) Solve each equation.

a) $2\sqrt{4x+5} - 3 = 7$

b) $9 + \sqrt{2x-1} = 16$