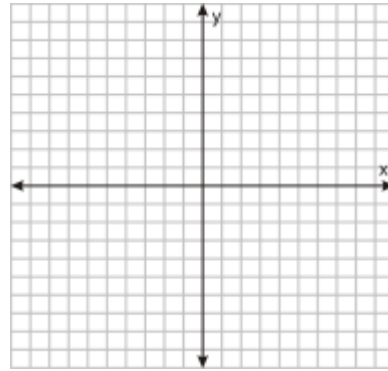
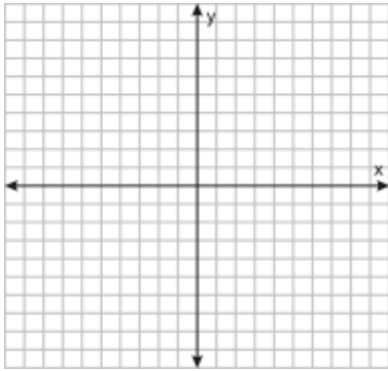




3. Find the slope and y-intercept of the equation of the line algebraically. Graph the line by hand. Label 2 points on each graph.

a)  $2x + 3y - 9 = 0$

b)  $3x + 7 = 0$



4. Find the equation of the line that passes through the points  $(-1, -3)$  and  $(14, 9)$ .

Point-Slope form: \_\_\_\_\_

Slope-Intercept form: \_\_\_\_\_

5. Find the equation of the line in slope intercept form that passes through the given point and has the indicated slope.

a)  $(-3, 6)$   $m = -2$

b)  $(2.3, -8.5)$   $m = 0$

6. Write the equation of the line that contains the point  $(2, 1)$  and is:

A) parallel to the line  $4x - 2y = 3$

Slope-Intercept form: \_\_\_\_\_

Standard form: \_\_\_\_\_

B) perpendicular to the line  $4x - 2y = 3$

Slope-Intercept form: \_\_\_\_\_

Standard form: \_\_\_\_\_

7. Simplify each expression:

a)  $(4x^3)^2$

b)  $(5x^2z^6)^3(5x^2z^6)^{-3}$

c)  $\sqrt[3]{\frac{32a^2}{b^3}}$

d)  $2\sqrt{50} + 12\sqrt{8}$

e)  $7\sqrt{80x} - 2\sqrt{125x}$

f)  $\sqrt[6]{(x+1)^4}$

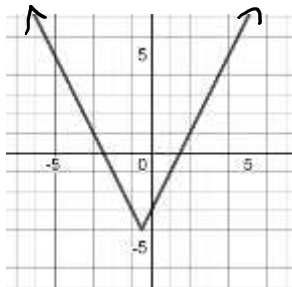
8. Rationalize the denominator of each expression:

a)  $\frac{1}{\sqrt{3}}$

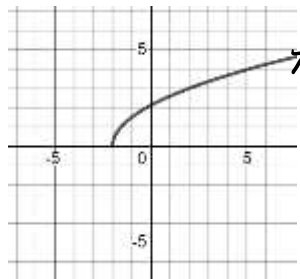
b)  $\frac{3}{\sqrt{5} + \sqrt{6}}$

c)  $\frac{5}{\sqrt{14} - 2}$

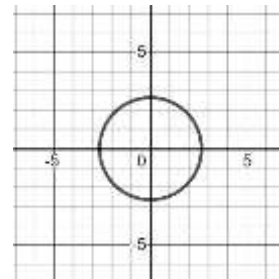
9. Determine if each of the following graphs represents one of the following choices: "NOT a Function" or "Function" or "One-to-One Function". Write your choice on the line below.



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_

10. Given the function,  $f(x) = x^2 - 4x + 5$ , evaluate and simplify:

a)  $f(2)$

b)  $f\left(\frac{3}{2}\right)$

c)  $f(x + 2)$

11. Find the domain of the function, use interval notation.

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

b)  $f(x) = \frac{3x}{2x^2 + 11x + 12}$

c)  $f(x) = \sqrt{2x + 5}$

12. Perform the indicated operations and write the result in standard form:

a)  $(2x^2 + 1) - (x^2 - 2x + 1)$

b)  $-4x(3 - x^3)$

c)  $(2x + 5)^2$

d)  $(7x - 2)(4x - 3)$

e)  $5x(x + 1) - 3x(x + 1)$

13. Factor each expression completely:

$4x^3 - 6x^2 + 12x$	$4 - 36y^2$	$9x^2 - 12x + 4$
$27x^3 + 64$	$3x^2 - 5x + 2$	$x^3 + 5x^2 - 5x - 25$
$12x^2 - 5x - 2$	$x^4 - 7x^2 - 18$	$x^8 - 1$

14. Solve each equation algebraically. Give exact solutions.

a)  $x^2 - 3x + 4 = 0$

b)  $6x^2 + 11x = 10$

c)  $3x^2 - 11 = 2x^2 + 2x$

15. Use the leading term test to describe the end behavior. You may use words or math notation.

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

b)  $g(x) = 6x^2 + 4x^5 - 11x^2 + 10$

16. Simplify completely. Write each number in standard form.

a)  $\sqrt{-54}$

b)  $-\sqrt{-20} + \sqrt{-80}$

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

d)  $(4 - 3i)^2$

e)  $(7 - 2i)(-2 + i)$

f)  $(5 + 3i)(5 - 3i)$

g)  $\frac{-7 + 6i}{9 - 4i}$

17. Write a 5<sup>th</sup> degree polynomial function, with real coefficients, whose zeros are  $-2, 2, 7,$  and  $-\sqrt{5}$ .

18. Given  $f(x) = 2x^2 - 3$  and  $g(x) = \sqrt{4 - x}$ , find the following.

a) Domain of  $f(x)$

b) Domain of  $g(x)$

c)  $(f + g)(x)$  and its domain

d)  $(g - f)(x)$  and its domain

e)  $\left(\frac{f}{g}\right)(x)$  and its domain

f)  $(fg)(x)$  and its domain

19. Simplify each rational expression completely. State the restrictions on the variable(s).

a)  $\frac{18y^2}{60y^5}$

b)  $\frac{2x^2y}{xy - y}$

c)  $\frac{x^3 + 5x^2 + 6x}{x^2 - 4}$

20. Perform the operation and simplify completely. State the restrictions on the variable(s).

a)  $\frac{3}{x - 1} + \frac{5x}{3x + 4}$

b)  $\frac{5}{x - 1} \cdot \frac{x - 1}{25(x - 2)}$

c)  $\frac{r}{r - 1} \div \frac{r^2}{r^2 - 1}$

d)  $\frac{t^2 - t - 6}{t^2 + 6t + 9} \cdot \frac{t + 3}{t^2 - 4}$

21. Solve each rational equation. State the restrictions on the variable.

a)  $\frac{x}{2} + \frac{6x}{7} = \frac{19}{14}$

b)  $3 + \frac{1}{x+2} = 4$

c)  $\frac{5x-4}{5x+4} = \frac{2}{3}$

d)  $\frac{1}{x-2} + \frac{3}{x+3} = \frac{4}{x^2+x-6}$

22. Given the one-to-one function,  $f(x) = 2x^3 - 5$ , find the inverse function.

23. Solve the equations algebraically.

a)  $8^{5x} = 16^{3x+4}$

b)  $\log_5(3x+1) = 2$

c)  $\log 5x + \log(x-1) = 2$



24. Given the quadratic function, find the vertex, axis of symmetry,  $x$  – intercepts,  $y$  – intercept, and graph and label at least 3 points. State the domain and range.

a)  $f(x) = -2(x + 4)^2 + 8$

b)  $g(x) = x^2 - 2x - 1$

Vertex:

Domain:

Vertex:

Domain:

AOS:

Range:

AOS:

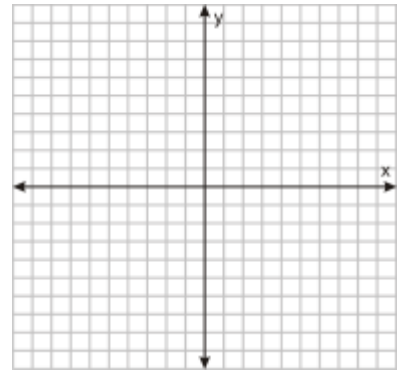
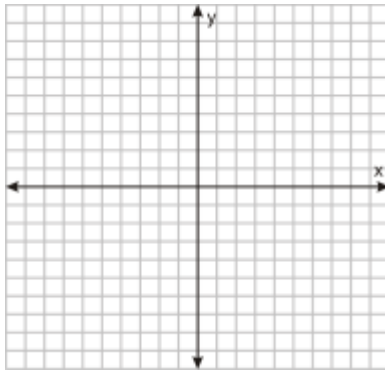
Range:

$x$  – int(s):

$x$  – int(s):

$y$  – int:

$y$  – int:



25. Given the following functions: describe all transformations. Graph the function using the described transformations. Label at least three points for each graph. State the domain and range.

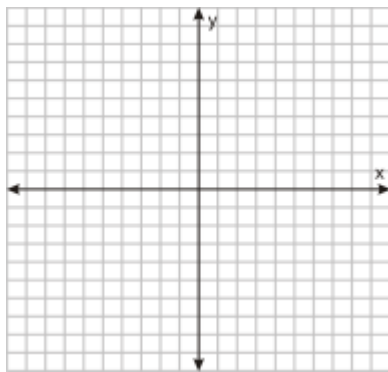
a)  $f(x) = 2(x + 1)^2$

Basic/Parent:

Transformations:

Domain:

Range:



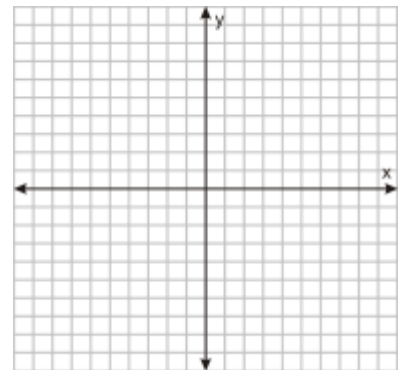
b)  $f(x) = -|x - 2| + 3$

Basic/Parent:

Transformations:

Domain:

Range:



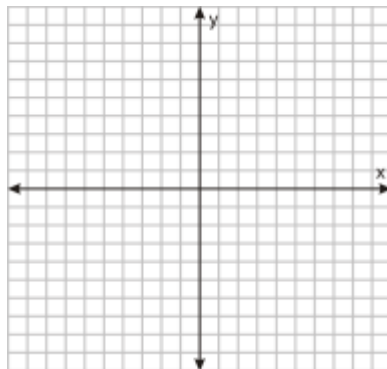
c)  $f(x) = 2\sqrt{x + 3}$

Basic/Parent:

Transformations:

Domain:

Range:



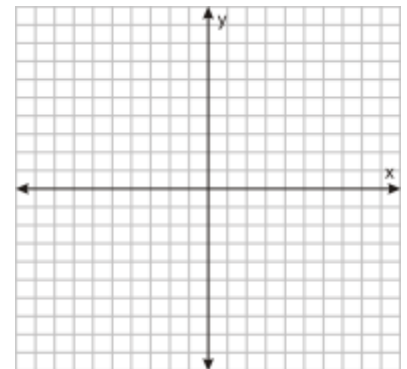
d)  $f(x) = 3(2)^x - 5$

Basic/Parent:

Transformations:

Domain:

Range:



26. Given the rational function,  $f(x) = \frac{2x^2 + 5x - 12}{x^2 + 3x - 4}$  find the following: (If any of the following Does Not Exist, then write NONE or DOES NOT EXIST in the space provided.)

a) Factor

b) Vertical Asymptote(s)

c) Coordinate of Hole(s)

d) Domain

e) Horizontal Asymptote

f)  $x$  – intercept(s)

g)  $y$  – intercept



*On my honor, I have neither given nor received unauthorized aid on this work.*

\_\_\_\_\_  
*Signature*

*I do not know of any violations of the Honor Code.*

\_\_\_\_\_  
*Signature*