7.1 – Solving Quadratic Equations (That Won't Factor)

A. <u>Square Root Each Side</u>

1. Solve: $x^2 = 10$

2. Solve: $x^2 = 48$

3. Solve: $x^2 = -20$

7.1 #18 Given the equation $x^2 = k$, match the following:

a. If $k > 0$, then___ 1. There is 1 real solution

b. If $k < 0$, then___ 2. There are 2 real solutions

c. If $k = 0$, then___ 3. There are 2 complex solutions

7.1 #13 Solve: $(t + 5)^2 = -18$

7.1 #18 Solve: $\left(x - \frac{3}{4}\right)^2 + \frac{7}{4} = 0$

Solve: $3(t - 1)^2 + 7 = 12$

B. Completing the Square:

1. Write your equation in the form:

2. If there's a leading coefficient, divide both sides by it.
3. Cut the number in front of x in half; write this new value on the line below.
4. Square this new value and write the product in the blank on the line above; add this product to the right side of the equation also.
5. Insert an x, parentheses and exponent on the left to complete the square.
6. Add together the values on the right side.
7. Square root each side of the equation. Don't forget the plus-or-minus sign!
8. Solve for x.

*Solve each by completing the square:

7.1 #36 Solve: $m^2 + 6m + 8 = 0$

7.1 #39 Solve: $p^2 + 4p + 6 = 0$

7.1 #41 Solve: $-3y - 10 = -y^2$

Aleks Problem: Find the value of k in order to have a completed square:

a. $x^2 + 10x + k$

b. $x^2 + kx + 16$

7.1 #43 Solve: $2a^2 + 4a + 5 = 0$

7.1 #60 Solve: $a^2 + b^2 = c^2$ for b.

7.1 #61 Solve: $V = \frac{1}{3}\pi r^2$ for r.

Solve: $5x^2 - 3x + 8 = 0$ by completing the square.

7.2 – The Quadratic Formula

Complete the square to solve for x:

$ax^2 + bx + c = 0$

7.2 #16 Solve: $2t^2 + 3t - 7 = 0$

7.2 #32 Solve: $\frac{2}{3}p^2 - \frac{1}{6}p + \frac{1}{2} = 0$

The expression $b^2 - 4ac$ under the radical of the quadratic formulas is called the _________.

<u>Three cases:</u>

If $b^2 - 4ac$ is negative,

If $b^2 - 4ac$ is zero,

If $b^2 - 4ac$ is positive,

7.2 #54 Find the value of the discriminant. Use it to determine the nature of the solutions.

$12y - 9 = 4y^2$

7.2 #44 The volume of a rectangular box is 64 ft^3. If the width is 3 times the height, and the length is 9 times the height, find the dimensions of the box.

7.3 – Equations in Quadratic Form

7.3 #14 Solve: $m^{2/3} - m^{1/3} - 6 = 0$

7.3 #16 Solve: $2t^{2/5} + 7t^{1/5} + 3 = 0$

7.3 #18 Solve: $y + 6\sqrt{y} = 16$

7.3 #22 Solve: $16\left(\frac{x+6}{4}\right)^2 + 8\left(\frac{x+6}{4}\right) + 1 = 0$

Solve: $m^{1/2} - 2m^{1/4} - 24 = 0$

<u>Sections 7.1 – 7.3 Review</u>

1. Solve $x^2 = 8x$ in three different ways.

2. Solve: $y^{2/3} + 5y^{1/3} + 4 = 0$

3. Solve: $4x(x+3)=6(2x-4)$

4. Solve: $2u(u-3)=4(2-u)$

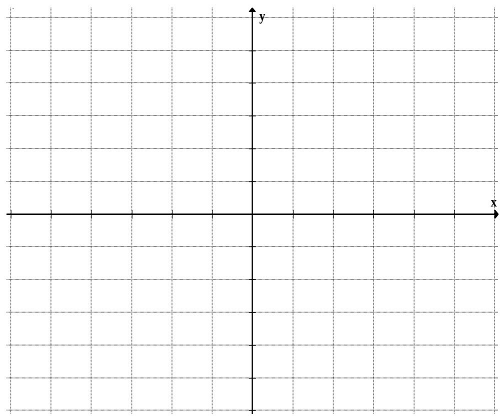
5. Solve: $a^4-10a^2+9=0$

6. Solve: $2\left(\frac{t-4}{3}\right)^2-\left(\frac{t-4}{3}\right)-3=0$

7. Solve: $x^{-2}-2x^{-1}-24=0$

7.4 & 7.5 – Graphing Parabolas

1. Base graph: $y = x^2$

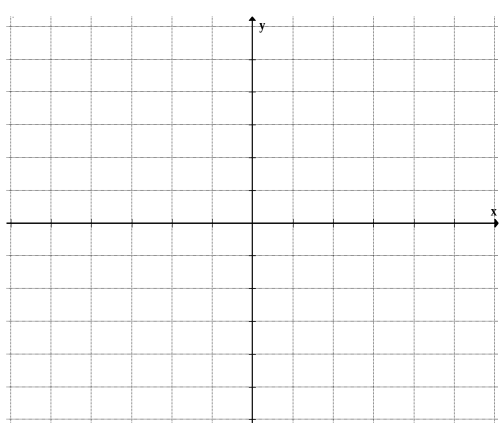


2. On the same axes, graph each of the following:

a. $y = 3x^2$

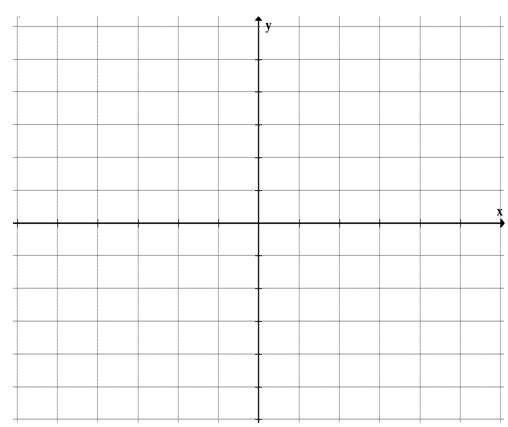
b. $y = \frac{1}{2}x^2$

c. $y = -2x^2$

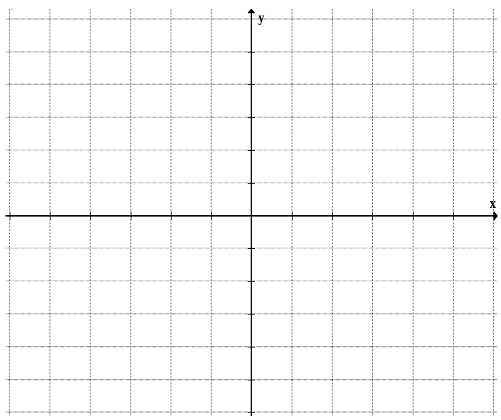


<u>General Formula:</u> $y = a(x-h)^2 + k$

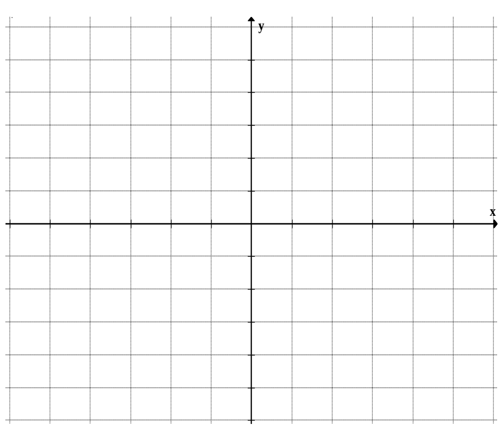
3. Graph: $y = (x+3)^2 - 2$



4. Graph: $y = \frac{-1}{2}(x+1)^2 + 2$

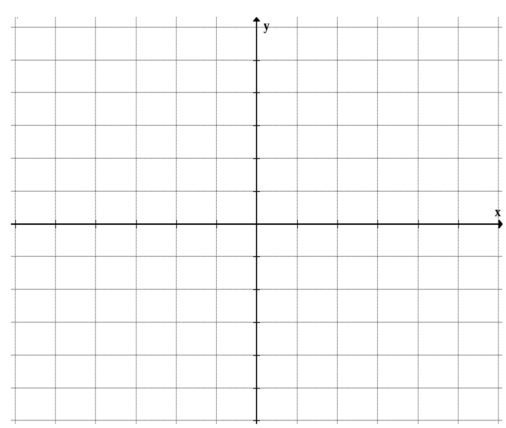


5. Graph: $y = 3(x-1)^2 - 4$



6. Referring to the previous problem, find the x-intercepts of $y = 3(x-1)^2 - 4$.

7. Graph: $y = \frac{2}{3}(x+2)^2 + 1$



7.5 #19 Find the vertex and the axis of symmetry. Name two additional points on each side of the vertex:

$$y = 2x^2 + 12x + 13$$

7.5 #21 Find the vertex and the axis of symmetry. Name two additional points on each side of the vertex:

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

8. Find the vertex and the axis of symmetry. Name two additional points on each side of the vertex:

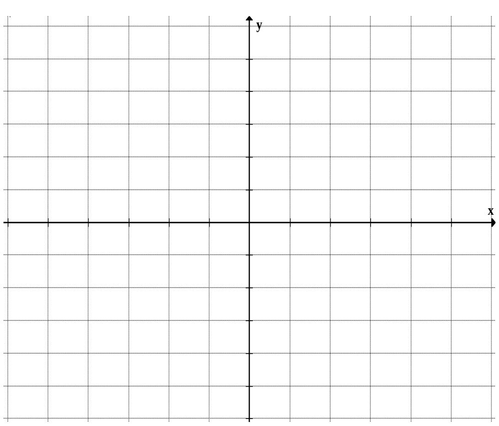
$$y = -\frac{2}{3}x^2 + 6x - \frac{7}{3}$$

9. Find the vertex and the axis of symmetry. Name two additional points on each side of the vertex:

$$y = \frac{4}{5}x^2 + 16x - 8$$

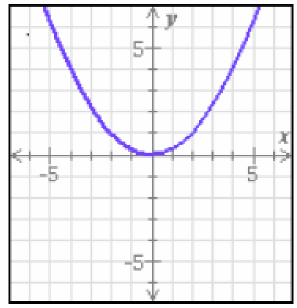
10. Graph. Label the vertex and x-intercepts.

$$y = x^2 - 4x - 5$$

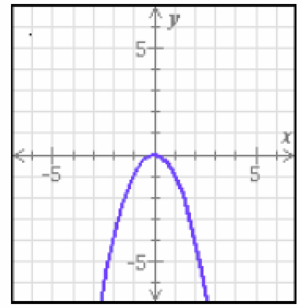


Aleks Problems (11-15):

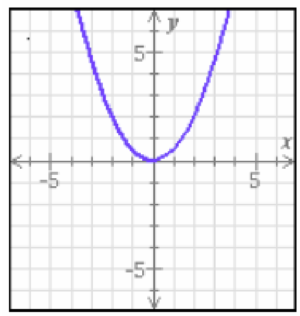
11. Look at the graphs and their equations below. Then fill in the information about the leading coefficients A, B, C, and D.



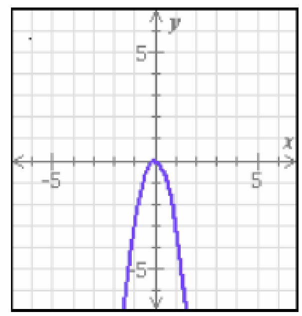
$y = Ax^2$



$y = Bx^2$



$y = Cx^2$



$y = Dx^2$

a. For each coefficient, choose whether it is either positive or negative.

A	B	C	D
Select One	Select One	Select One	Select One

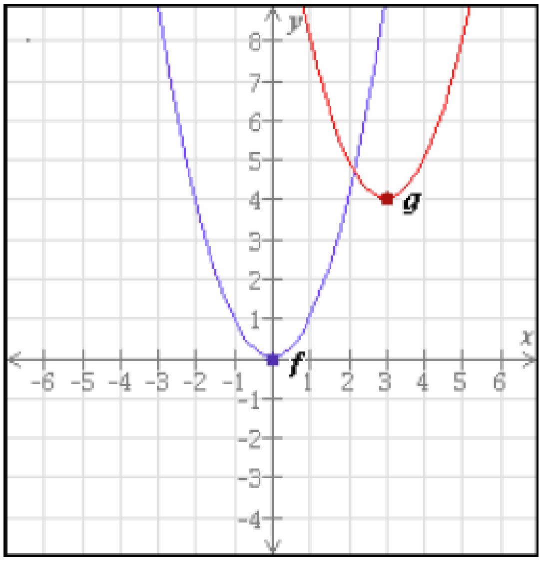
b. Choose the coefficient closest to 0.

c. Choose the coefficient with the greatest value.

12. If the graph of the function f defined by $f(x) = x^2 - 7$ is translated vertically upwards by 9 units, it becomes the graph of a function h. Find the expression for $h(x)$.

13. The graph of f (in blue) is translated a whole number of units horizontally and vertically to obtain the graph of g (in red).

The function f is defined by $f(x) = x^2$.
Write down the expression for $g(x)$.



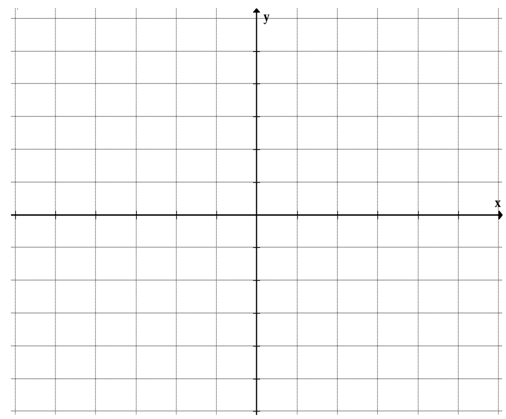
14. The cost C (in dollars) of manufacturing x dresses at Kala's Fashion Warehouse is given by the function $C(x) = 0.3x^2 - 90x + 25{,}136$
What is the minimum cost of manufacturing dresses? Do not round your answer.

15. A ball is thrown vertically upward. After t seconds, its height h (in feet) is given by the function $h(t) = 112t - 16t^2$. What is the maximum height that the ball will reach? Do not round your answer.

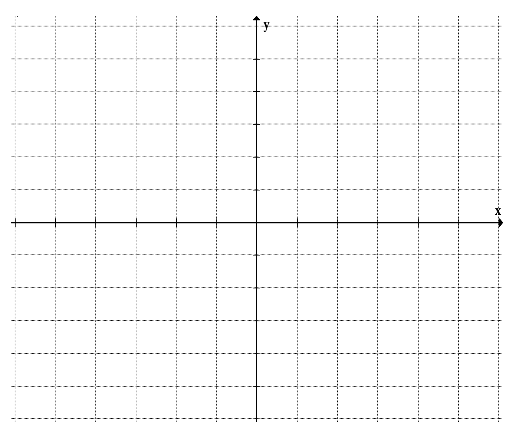
16. A farmer wishes to fence in a rectangular pen such that the side of his house serves as one side of the pen. If he has only 40 feet of fencing, what dimensions of the pen will produce the maximum area possible?

Review of sections 7.4-7.5:

1. Graph: $y = 2(x-3)^2 - 1$



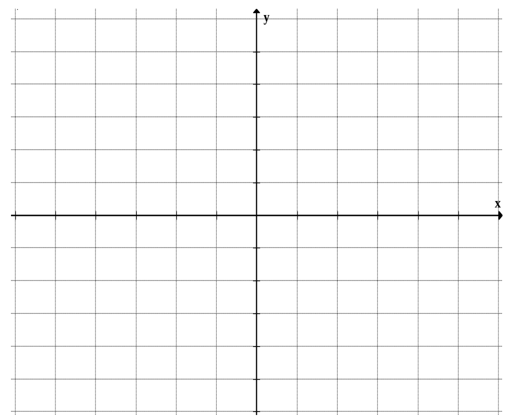
2. Graph: $y = \frac{-2}{3}(x+1)^2 - 1$



3. Find the vertex of $y = \frac{2}{3}x^2 - 6x + 2$.
Also state two additional points on each side of the vertex.

4. Find the vertex of $y = \frac{-4}{3}x^2 - \frac{16}{3}x - \frac{19}{3}$.
Also state two additional points on each side of the vertex.

5. Graph $y = \frac{-1}{2}(x+2)^2 + 1$. Also state two additional points on each side of the vertex. Find the x-intercepts.



8.1 – Compound Ineqaulities

$\cup$ $\quad OR \quad$ $union$
$\cap$ $\quad AND \quad$ $intersection$

Given the following sets,

$A = \{1, 2, 3, 5\}$
$B = \{1, 2, 3\}$
$C = \{2, 4, 6\}$

find the requested unions or intersections:

$A \cup B$= __________

$A \cap B$= __________

$A \cap C$= __________

*Find each union or intersection. Write each using interval notation.

1. $x \leq 2 \text{ and } x < 4$

2. $x \leq 7 \text{ and } x > 5$

3. $x < 8 \text{ or } x \leq 3$

4. $x > 2 \text{ or } x \leq 7$

5. $x \geq 2 \text{ or } x \leq 1$

6. $x < -3 \text{ and } x \geq 0$

8.1 #16 $5p + 2p \geq -21 \text{ and } -9p + 3p \geq -24$

8.1 #20 $\frac{5}{2}(a + 2) < -6 \text{ and } \frac{3}{4}(a - 2) < 1$

8.1 #66 $\frac{y-7}{-3} < \frac{1}{4}$ or $\frac{y+1}{-2} > \frac{-1}{3}$

Solve: $15 \leq 3x + 2 < 20$

8.2 – Polynomial and Rational Ineqaulities

8.2 #20 $(p-4)(p+2) > 0$

8.2 #22 $-8(2t+5)(6-t) < 0$

8.2 #24 $w^2(3-w)(w+2) \geq 0$

8.2 #36 $x^3 + 36 > 4x^2 + 9x$

8.2 #46 $\frac{a+2}{a-3} < 0$

8.2 #46 $\frac{x-2}{x+6} \leq 5$

8.3 – Absolute Value Equations

Solve: $|x| = 8$

Solve: $|x + 5| = 3$

8.3 #14 $|w| + 4 = -8$

8.3 #18 $|4x + 1| = 6$

8.3 #22 $\left|\frac{w}{2} + \frac{3}{2}\right| - 2 = 7$

8.3 #44 $|9a + 5| = |9a - 1|$

8.3 #462 $\left|\frac{3p+2}{4}\right| = \left|\frac{1}{2}p - 2\right|$

8.4 – Absolute Value Inequalities

Properties

A. $|x| = a \quad \rightarrow \quad x = -a \;\; or \;\; x = a$

B. $|x| < a \quad \rightarrow \quad -a < x < a$

C. $|x| > a \quad \rightarrow \quad x < -a \;\; or \;\; x > a$

*Solve the following inequalities. Write your solution sets using interval notation.

1. $|x + 5| < 14$

2. $3|2x - 5| + 7 \leq 19$

3. $|5x + 2| - 3 > 8$

4. $|x + 5| + 8 \geq 2$

5. $|x + 5| \leq -6$

6. $5|2x - 1| + 8 \geq 19$

7. $|3 - 7x| < 13$

8. $3\left|\frac{2x}{3} - 4\right| + 5 \geq \frac{17}{2}$

<u>Review of Sections 8.1 – 8.4</u>

1. Solve: $(x + 2)(x - 3) \geq 0$

2. Solve: $x^2 - x - 30 < 0$

3. Solve: $\frac{x+1}{x+4} \geq 0$

4. Solve: $x + 2 \geq 5 \ \ and \ \ x - 8 \leq 3$

5. Solve: $|3x - 2| + 4 \geq 17$

6. Solve: $x^2 + 3x - 18 < 0$

7. Solve: $3x + 5 < 17 \ \ or \ \ -2x + 1 > -3$

8. Solve: $-2|x + 5| - 4 > -18$

9. Solve: $|4x + 2| = |7x - 8|$

10. Solve: $\frac{2x-1}{x-3} \leq 0$

11. Solve: $(2x - 4)(x + 1)(x - 2) < 0$

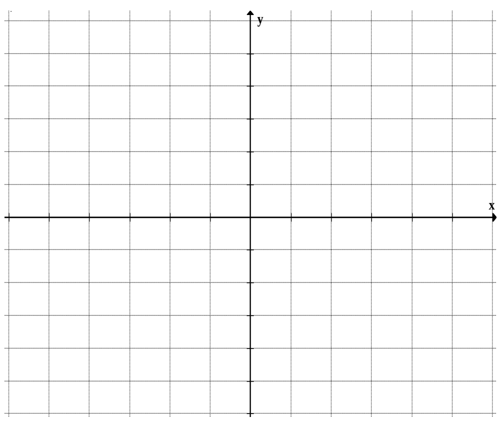
12. Solve: $(x + 1)(x - 2)(x + 3)(x - 4) < 0$

13. Find the vertex and two additional points on either side of it: $y = \frac{1}{3}x^2 + \frac{4}{3}x - \frac{7}{3}$

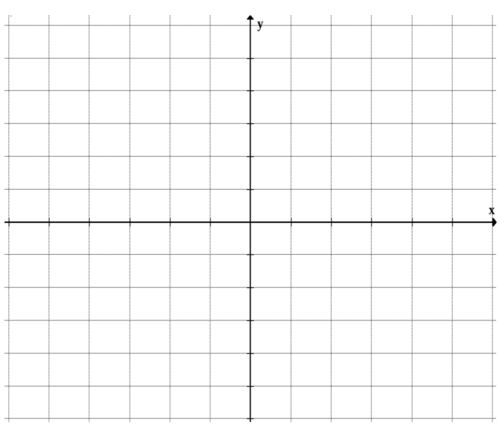
8.5 –Inequalities In the Plane

Rules for Shading:

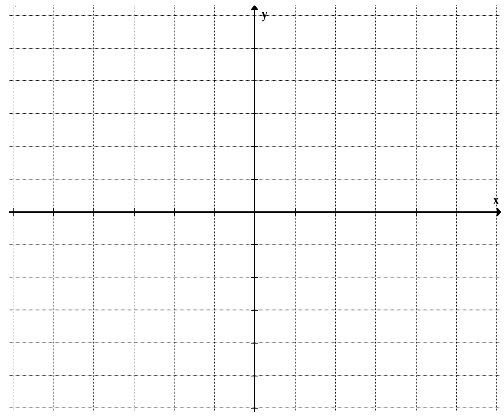
Solve: $\begin{cases} y > -2x + 3 \\ y \le \frac{1}{2}x - 2 \end{cases}$



Solve: $\begin{cases} x < 2 \\ y \ge 1 \end{cases}$



Graph: $5x - 3y < 15$



Aleks Problem: On the final exam, Ahmad needs more than 60 points to get an A in the class. The exam has true/false questions, worth 2 points each, and multiple choice questions, worth 4 points each. Let x be the number of true/false questions he gets correct, and let y be the number of multiple choice questions he gets correct. Write an inequality showing how Ahmad can get enough points for an A in the class.

Aleks Problem: Justin is serving his kids french fries and chicken wings for lunch today. He wants the total calorie count from the french fries and chicken wings to be less than 600 calories. Each french fry has 33 calories, and each chicken wing has 121 calories. Write an inequality giving the number of french fries, f, and the number of chicken wings, c, that he can serve and still follow his calorie plan.

Chapter 7 & 8 Review

*Solve each quadratic equation:

1. $x^2 = -48$

2. $(x+5)^2 + 8 = 19$

3. $x^2 + 10x + 7 = 0$ in two ways

4. $3x^2 + 15x - 2 = 0$

5. $\frac{1}{5}h^2 + h + \frac{3}{5} = 0$

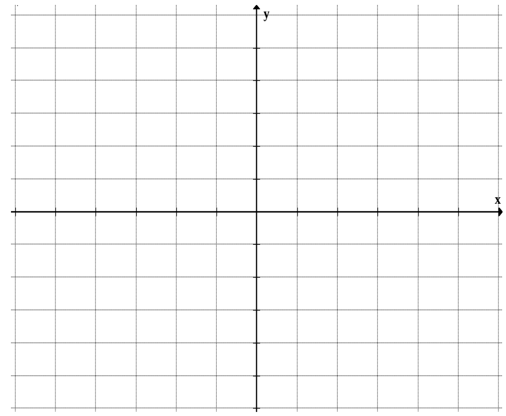
6. $x - 6\sqrt{x} + 8 = 0$

7. $x - 2\sqrt{x} - 15 = 0$

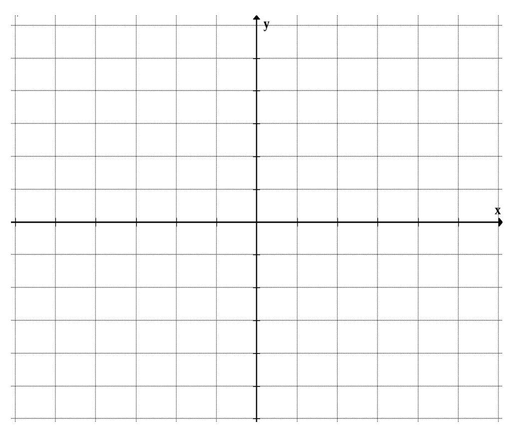
8. $2n^4 - n^2 - 3 = 0$

9. $x^{2/5} + x^{1/5} - 6 = 0$

10. Graph: $y = \frac{1}{5}(x-3)^2 - 2$ and find its x-intercepts.



11. Graph: $y = (x+2)^2 - 2$



12. Find the vertex of $y = 3x^2 + 2x - 7$ and two additional points on each side of the vertex.

13. Find the vertex of $y = \frac{4}{3}x^2 + \frac{5}{3}x - \frac{7}{3}$ and two additional points on each side of the vertex.

14. Solve: $3x - 2 < 8 \ or \ 2x - 1 \geq 7$

15. Solve: $x < 2 \ or \ x > 2$

16. Solve: $x \leq 3 \ and \ x \geq 3$

17. Solve: $x \leq 8 \ and \ x < 4$

18. Solve: $(x - 3)(x + 4) \leq 0$

19. Solve: $(x - 2)^2(x + 1)(x - 5) > 0$

20. Solve: $\frac{x+5}{x-3} \geq 0$

Recall...

A. $|x| = a \quad \rightarrow \quad x = -a \;\; or \;\; x = a$

B. $|x| < a \quad \rightarrow \quad -a < x < a$

C. $|x| > a \quad \rightarrow \quad x < -a \;\; or \;\; x > a$

21. Solve: $|3x - 1| + 7 \geq 9$

22. Solve: $|3x + 7| = 13$

23. Solve: $5|3 - 4x| \geq 20$

24. Solve: $|5x - 9| = |-4x + 11|$

25. Solve: $|5x - 2| + 8 \leq 13$

26. Solve: $|2x - 3| \leq -8$

27. Solve: $|2x - 3| \geq -8$

9.1 – The Algebra of Functions

1. Given $\begin{cases} f(x) = x^2 + 3 \\ g(x) = x - 2 \end{cases}$, find the following:

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

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

c. $(f \cdot g)(-2)$

d. $f \circ g(x)$

e. $g \circ f(x)$

f. $f \circ g(3)$

2. Given $\begin{cases} f(x) = \sqrt{x + 1} \\ g(x) = 2x - 5 \\ h(x) = x^2 - 3 \end{cases}$, find the following:

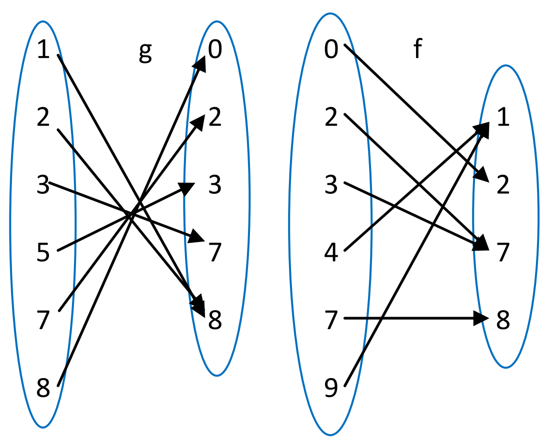
a. $f \circ g(x)$

b. $h \circ f(x)$

c. $g \circ h(5)$

d. $g \circ g(3)$

ALEKS PROBLEM: Two functions g and f are defined in the figures below:



Find the domain and range of the composite function $f \circ g$. Write your answers in set notation.

The domains of $f+g, f-g$ and fg will **all be the same** (the intersection of their separate domains). The domain of $\frac{f}{g}$ will be further restricted so that $g(x) \neq 0$.

To find the domains of **composite** functions, compose them and then analyze the function that results.

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

a. the domain of $f(x)$.

b. the domain of $g(x)$.

c. the domain of $f+g, f-g$ and fg.

d. the domain of $\frac{f}{g}(x)$.

4. Given $f(x) = \frac{x+3}{x-4}$ and $g(x) = \frac{x-1}{x+2}$, find...

a. the domain of $f(x)$.

b. the domain of $g(x)$.

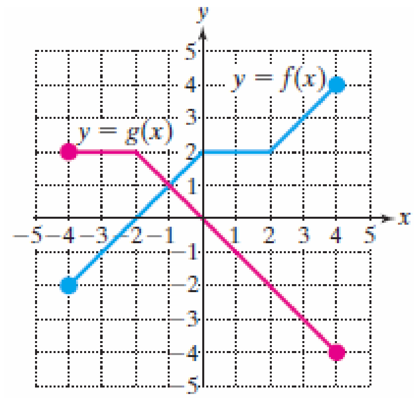
c. the domain of $f+g, f-g$ and fg.

d. the domain of $\frac{f}{g}(x)$.

To find the domain of a composite function, find the composition and then analyze it.

5. Given $f(x) = \sqrt{x-3}$ and $g(x) = x + 7$, find the domain of $f \circ g(x)$.

Exercises from section 9.1 of your text...



45. $f(-4)$ **46.** $f(1)$ **47.** $g(-2)$

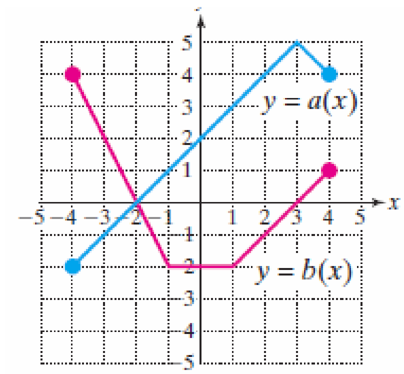
48. $g(3)$ **49.** $(f+g)(2)$ **50.** $(g-f)(3)$

51. $(f \cdot g)(-1)$ **52.** $(g \cdot f)(-4)$ **53.** $\left(\frac{g}{f}\right)(0)$

54. $\left(\frac{f}{g}\right)(-2)$ **55.** $\left(\frac{f}{g}\right)(0)$ **56.** $\left(\frac{g}{f}\right)(-2)$

57. $(g \circ f)(-1)$ **58.** $(f \circ g)(0)$ **59.** $(f \circ g)(-4)$

60. $(g \circ f)(-4)$ **61.** $(g \circ g)(2)$ **62.** $(f \circ f)(-2)$



63. $a(-3)$ **64.** $a(1)$ **65.** $b(-1)$

66. $b(3)$ **67.** $(a-b)(-1)$ **68.** $(a+b)(0)$

69. $(b \cdot a)(1)$ **70.** $(a \cdot b)(2)$ **71.** $(b \circ a)(0)$

72. $(a \circ b)(-2)$ **73.** $(a \circ b)(-4)$ **74.** $(b \circ a)(-3)$

75. $\left(\frac{b}{a}\right)(3)$ **76.** $\left(\frac{a}{b}\right)(4)$ **77.** $(a \circ a)(-2)$

79. The cost in dollars of producing x toy cars is $C(x) = 2.2x + 1$. The revenue received is $R(x) = 5.98x$. To calculate profit, subtract the cost from the revenue.

a. Write and simplify a function P that represents profit in terms of x.

b. Find the profit of producing 50 toy cars.

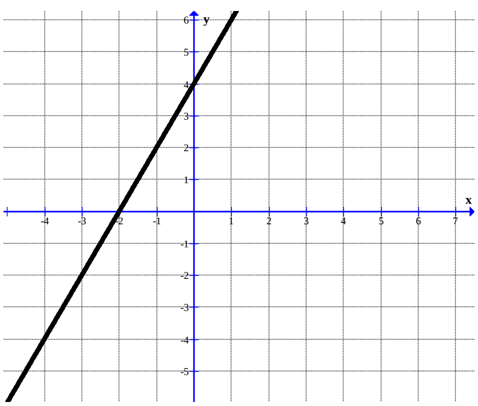
9.2 – Inverse Functions

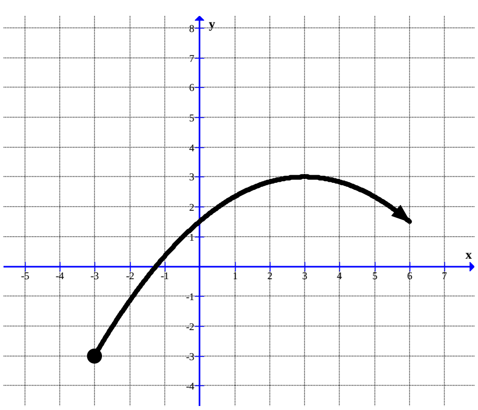
A function is ______________________________ if it passes both a vertical and horizontal line test. If a function is one-to-one, then it is ______________________ (it has an inverse which is also a function).

To find the inverse of a function from its **equation**, switch the x and y, and then solve for the "new" y.

To find the inverse of a function from its **graph**, reflect the graph across the line ____________. If (a, b) is on $f(x)$, then (b, a) is on the graph of its inverse.

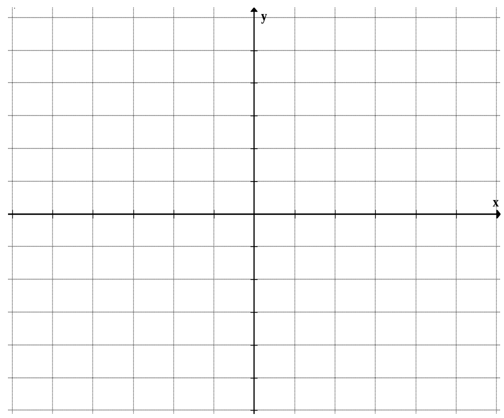
*Given the graph of $f(x)$, graph its inverse.



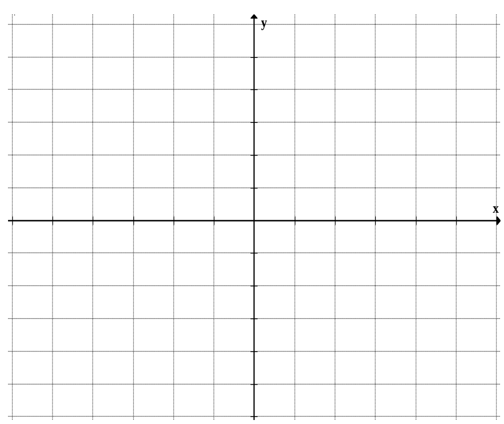


*Find the inverse of each function and then each on the same graph:

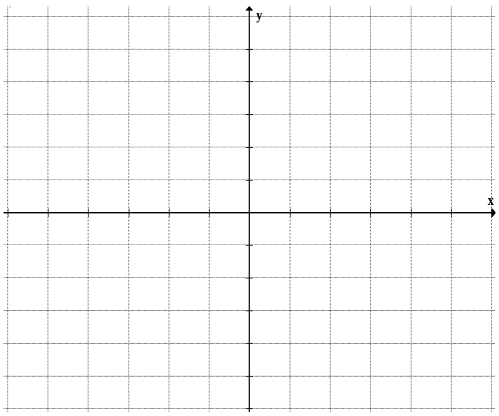
1. $g(x) = 3x - 2$



2. $h(x) = x^2 + 2$



3. $f(x) = \sqrt{x+1}$



To <u>prove</u> algebraically that two functions are inverses of each other, show that $f \circ f^{-1}(x) = x$ and $f^{-1} \circ f(x) = x$.

4.1 #57 Prove that $f(x) = \sqrt[3]{x+5}$ and $g(x) = x^3 - 5$ are inverses of each other.

Aleks Problem: The one-to-one functions g and h are defined as follows:

$g = \{(-7,1), (1,5), (2,0), (5,-4), (6,3)\}$

$h(x) = 2x + 3$

Find the following:

$g^{-1}(5) =$

$h^{-1}(x) =$

$(h^{-1} \circ h)(-4) =$

Aleks Problem: Given $f(x) = \sqrt{-x-2}$ and $g(x) = |x| + 2$, find the following:

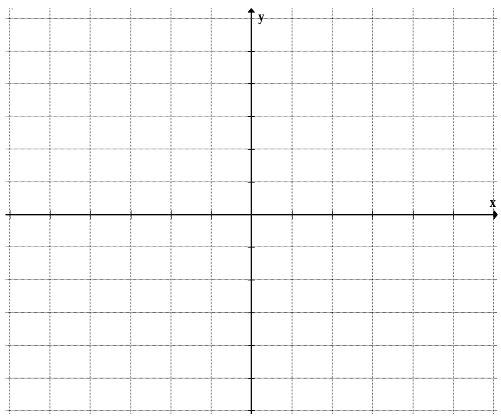
a. $g \circ f(x)$

b. the domain of $g \circ f(x)$.

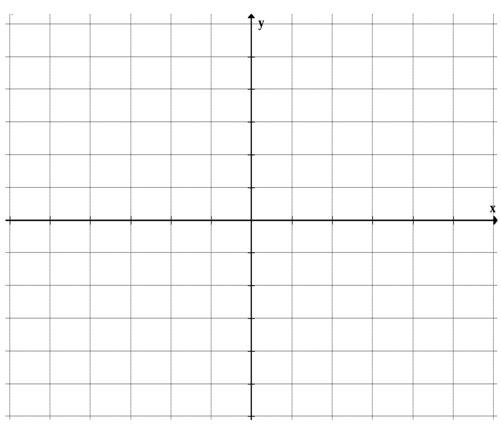
9.3, 9.4 – Exponential & Logarithmic Functions

$y = a^x$ is an expenetial equation.

1. Graph: $y = 2^x$



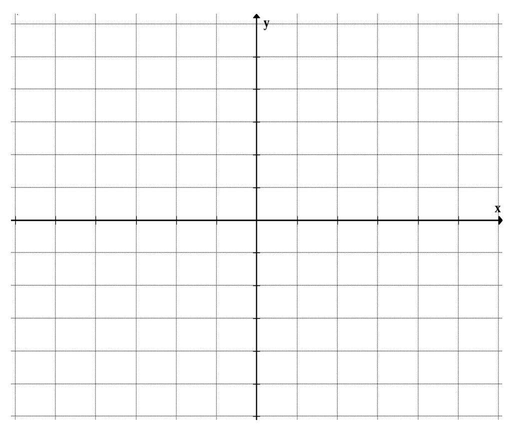
2. Graph: $y = \left(\frac{1}{2}\right)^x$



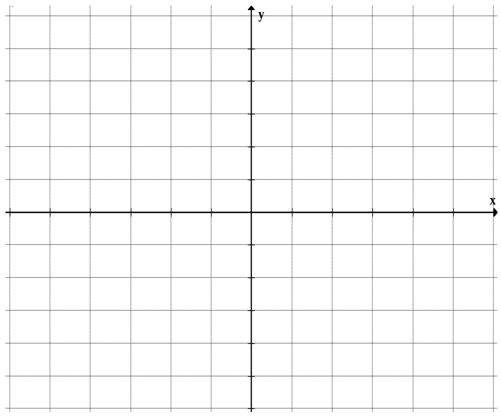
Convert each from logarithmic form to exponential form (or vice versa):

Logarithmic Form	Exponential Form

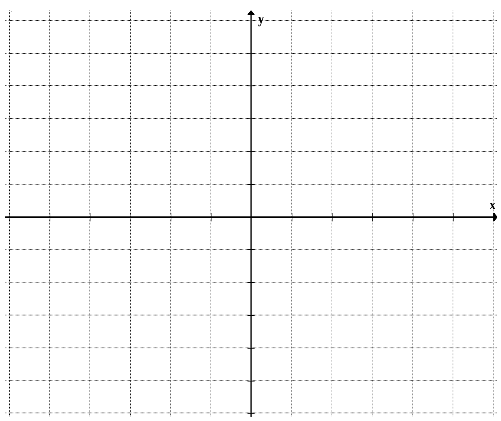
3. Graph $y = log_2 x$



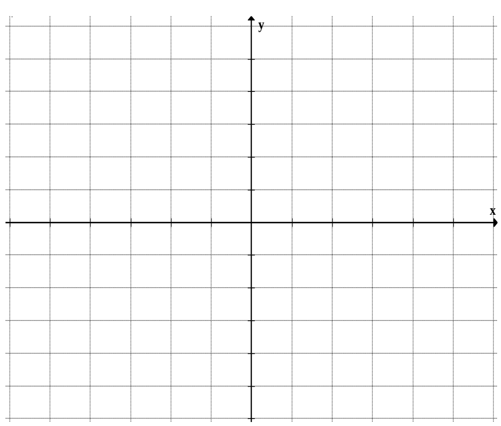
4. Graph: $f(x) = 4log_2 x + 1$



5. Graph: $f(x) = \frac{1}{2} log_3(x + 1) - 2$



6. Graph: $f(x) = 3log_4(x - 2) + 1$



7. State the domain of $f(x) = log_4(x + 7)$

8. SUMMARY OF DOMAINS: Find the domain of each function. Write each using interval notation.

a. $f(x) = \frac{x+1}{x-2}$

b. $g(x) = \sqrt{x - 2}$

c. $h(x) = \log(x - 2)$

Solve each equation:

9. $log_x 16 = 4$

10. $log_3 x = 5$

11. $log_5 25 = x$

Evaluate each of the following:

12. $log_3 81$

13. $log_{10}(10{,}000)$

14. $log_2\left(\frac{1}{64}\right)$

15. If $12,000 is borrowed for 15 years at 3.75% interest, compounded annually, and then paid in full at the end of that period, how much must be paid back at that time?

Use $A = P(1+r)^t$

16. If $15,000 is borrowed for 12 years at 4.5% interest, compounded annually, and then paid in full at the end of that period, how much must be paid back at that time?

9.5 – Solving Exp. & Log. Equations

Properties of Logarithms:

1. $log(xy) = logx + logy$
2. $log\left(\frac{x}{y}\right) = logx - logy$
3. $log(x^p) = p \cdot logx$
4. $log_a(1) = 0$
5. $log_a(a) = 1$
6. $log_a(a^x) = x$
7. $a^{log_a x} = x$

*Write each as separate, simplified logarithms:

1. $log(xy^2)$

2. $log\left(\frac{\sqrt{x}}{yz}\right)$

9.5 #68 Write as a single, simplified log:

$$log_5 a - \frac{1}{2} log_5 b - 3log_5 c$$

9.5 #76 Write as a single, simplified log:

$$log_x(p^2 - 4) - log_x(p - 2)$$

Aleks Problem: Fill in the missing values that make the equations below true:

(a) $\log_4 3 + \log_4 7 = \log_4 \square$

(b) $\log_5 8 - \log_5 \square = \log_5 \frac{8}{9}$

(c) $2\log_8 5 = \log_8 \square$.

9.6 – Commin and Natural Logarithms

Calculators: Exponents and Logarithms

Exponential keys:

Logarithmic keys:

Definition: As $x \to +\infty$, $\left(1 + \frac{1}{x}\right)^x \to e$

On your calculator, find the following values:

1. $(3.07)^{1.42} \approx$

2. $e \approx$

3. $log(4387) \approx$

4. $ln(317) \approx$

5. $e^{3.78} \approx$

6. $log_7(56) \approx$

Change-of-Base Formula: $log_b n = \frac{\log n}{\log b}$

7. $log_5(45) \approx$

Compound interest: $A = P\left(1 + \frac{r}{n}\right)^{nt}$

8. $1000 is invested at 1.2% for 10 years. Find the value of the account after 10 years if the interest is compounded....

a. quarterly.

b. monthly.

c. daily.

d. continuously. $Use\ A = Pe^{rt}$.

9.7 – Exponential and Logarithmic Equations

A. Expeontial – Same Base

9.7 #45 Solve: $2^{-x} = 64$

9.7 #52 Solve: $4^{2x-7} = \frac{1}{128}$

9.7 #55 Solve: $16^{-x+1} = 8^{5x}$

B. Expeontial – Different Base

9.7 #45 $8^{x} = 21$

9.7 #69 $3^{x+1} = 5^{x}$

9.7 #62 $e^x = 0.3151$

C. Logarithmic Equations

9.7 #27 Solve: $log_3 8 - log_3(x+5) = 2$

9.7 #29 Solve: $log_2(h-1) + log_2(h+1) = 3$

9.7 #30 Solve: $log_3 k + log_3(2k+3) = 2$

9.7 #36 Solve:

$log_4(6y-7) + \log_4 3 = log_4 5$

If $1500 is invested at 2.25%, compounded monthly, how long would it take to grow into $1800?

Your favorite Uncle Bob leaves you $5,000 in his will. If you need it to double in 5 years, at what interest rate should you invest it if the interest is compunded daily?

For how long should $1000 be invested at 1.1% compounded daily in order for the money to double?

How much should be invested at 1.1%, compounded daily, to grow to $2000 in 6 months?

10.1 – Distance and Midpoint

Distance Formula:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Midpoint Formula: $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

Derrivation of Formulas:

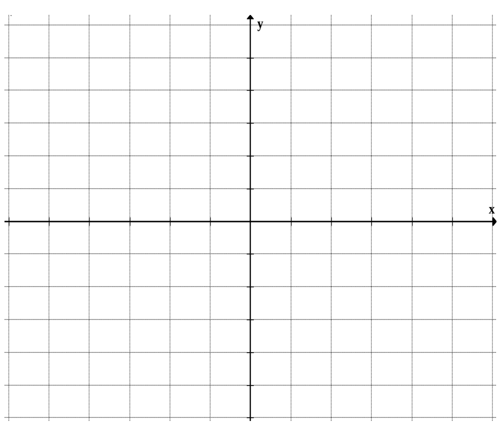
1. Find the distance and midpoint between $(-3,5)$ and $(7,2)$.

2. Find the distance and midpoint between $(4, \frac{5}{2})$ and $(-5, -1)$.

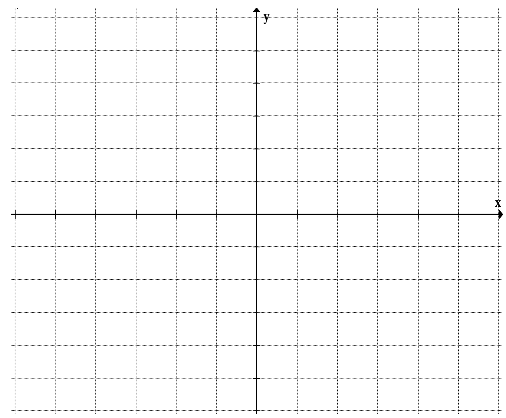
Chapter 9 Review

1. Solve: $-log_2(x-4) = 3 - log_2(x+3)$

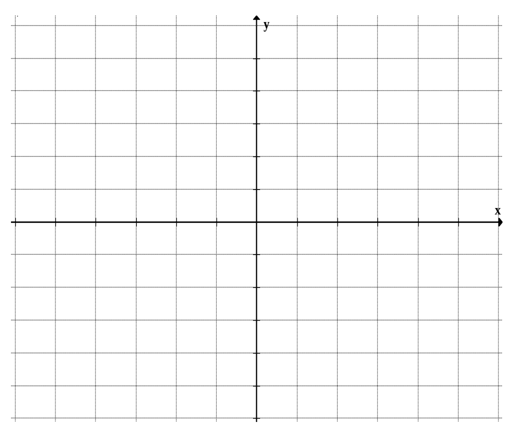
2. Graph: $g(x) = 3log_4(x-2) + 1$



3. Graph: $h(x) = -2log_2(x+1) + 3$



4. Graph $y = 3^{x+2} - 1$



5. Solve: $3^{x+4} = 81$

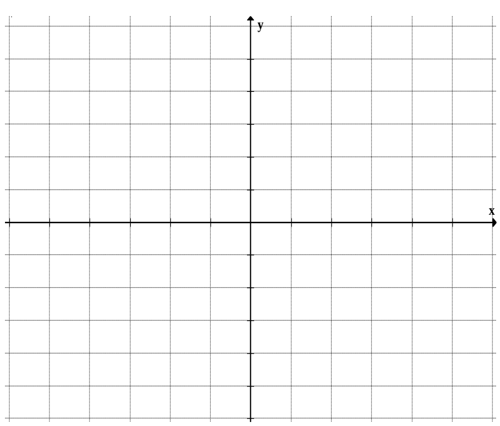
6. Solve: $3^{x+4} = 85$

7. Solve: $log x - 1 = -log(x - 9)$

8. Solve: $\ln(21) = 1 + \ln(x - 2)$

9. For how long should $800 be invested at 4.3%, compounded daily, in order for it to grow to $2000?

10. Find and graph the inverse of $f(x) = 3x^2 - 1$



11. Write as a separate, simplified logarithm:

$log\sqrt[6]{\frac{xy^2}{z}}$

12. Evaluate $log_3\left(\frac{1}{27}\right)$

13. Evaluate $log_5 75$

14. Solve: $e^{3x} = 17$

15. Given $f(x) = \sqrt{x+3}$ and $g(x) = x^2 - 1$, find the following:

a. $(f+g)(1)$

b. $f \circ g(x)$

c. $g \circ f(4)$

d. the domain of $f+g, f-g$, and fg.

e. the domain of $\frac{f}{g}$.

ALEKS PROBLEM:

Given $f(x) = \frac{2x+3}{7x-8}$, find the following:

a. $f^{-1}(x)$

b. the domain of $f^{-1}(x)$.

c. the range of $f^{-1}(x)$.