

Concerning calculators, graphing calculators are used only occasionally in the course. At times, we will be use four function calculators and scientific calculators. You should be able to complete this summer packet without a calculator.

The following **parent functions** will be included in the Algebra II curriculum:

Quadratic $y = x^2$ Absolute value $y = |x|$ Square root $y = \sqrt{x}$

Cube $y = x^3$ Cubic root $y = \sqrt[3]{x}$ Exponential $y = 2^x$

Logarithm $y = \log_2 x$

Here is a preview of the topics that you will learn in Algebra II.

Fall Semester	Spring Semester
Absolute Value Functions	Cubic/Cube Root Functions
Systems of Equations and Inequalities Functions	Operations of Polynomials and Rational Functions
Quadratic Relations and Functions	Rational Functions
Quadratic and Square Root Functions	Exponential and Logarithmic Functions
Transformations of Functions	Data Analysis

Therefore, refreshing your Algebra I topics and math skills will help you to be successful in Algebra II.

A. Solving/Evaluation equations/expressions.

1. $6x + 7 = 31$

2. $30 = 10(x - 2)$

3. $\frac{1}{7}(28x + 21) = 14$

4. $-9 = \frac{5a + 7 - 3a}{3}$

5. $2x + 17 = \frac{3 - 15x}{7}$

6. $4(n - 2) = 6n + 5 - 2n$

7. Evaluate $x^2 + 2x + 3$, when $x = 2$

8. Evaluate $\frac{de}{d+e}$, when $d = 10$, and $e = 15$

9. Evaluate $2g - 2h$, when $g = -1$, and $h = -4$

B. Applications

1. a) The three sides of a triangle have lengths x , $5x - 3$ and $2x + 12$. In terms of "x," what is the perimeter? b) If the perimeter of this triangle is 16, what is the longest side of this triangle?

2. The length of a rectangular garden is given by $3x + 5$ and the width of the garden is given by $2x - 1$. If the perimeter of the garden is 78 feet, find its dimensions.

3. It costs \$10 to rent a VCR and \$2 for each videotape. If you have \$18, how many videotapes can you rent? Write an equation to represent the situation and find how many videotapes you can rent.

4. The daily cost of renting a car is \$20 plus \$.40 per mile traveled. If Effie paid \$108 for a day's rental, how many miles did she travel?

C. Solve the inequalities and graph.

1. $-3x < 12$



2. $-4 \geq -17 + p$



3. $2(3b+4) \leq 9b+2$



D. Equations of lines.

What is the slope intercept form: _____

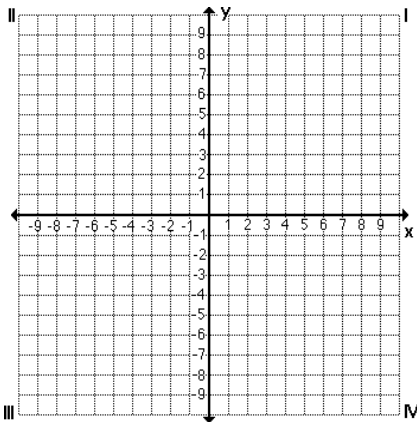
What is the standard form: _____

What is the point slope form: _____

What are functions? 4 ways to present functions, what are those?

1. _____ 2. _____ 3. _____ 4. _____

5. Graph: $f(x) = \frac{7}{3}x - 2$



7. Which function is modeled by the table?

x	-5	0	1	3
y	-9	1	3	7

[A] $y = x - 3$

[B] $y = -x + 4$

[C] $y = 3x$

[D] $y = 2x + 1$

6. Find the slope of the line passing through the points (4, 5) and (8, -1).

M: _____

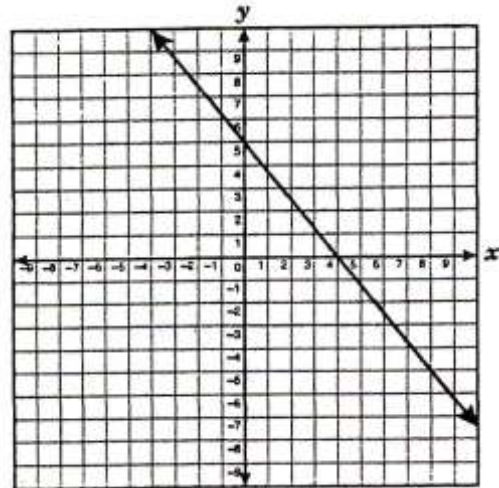
8. What are the x- and y-intercepts of the function graphed below?

[A] (4, 0), (5, 0)

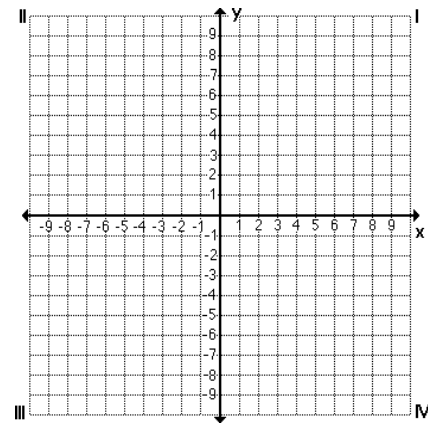
[B] (4, 0), (0, 5)

[C] (0, 4), (5, 0)

[D] (0, 4), (0, 5)

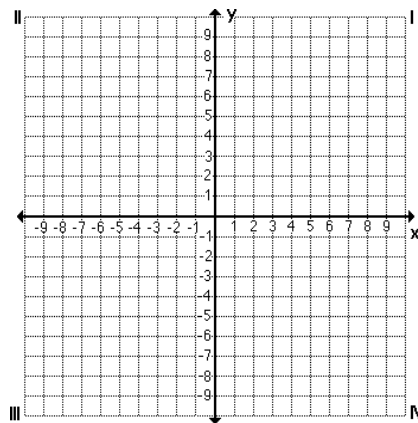


9. Graph: $3x - 7y = -21$



10. A line goes through the point (3, -2) and

has a slope of $\frac{1}{2}$. Graph this line.



11. Write an equation for the line with undefined slope that passes through the point (6, 3).

12. Find the equation of the line that contains (5, -1) and (7, 1).

Answer: _____

Answer: _____

13. Write an equation of the line with slope 2 and y-intercept 12.

Answer: _____

14. Write an equation of the line that passes through the point (2, -5) with slope -3.

Answer: _____

15. Write the slope-intercept form of the equation of the line passing through the point (-5, -3) and parallel to the line $y = 5x + 4$.

Answer: _____

16. Give the slope-intercept form of the equation of the line that is perpendicular to $-3x - 6y = -4$ and passes through the point (9, 8).

Answer: _____

E. Literal Equations

1. Solve for T .

$$B = Fp + T$$

F. Systems of Equations

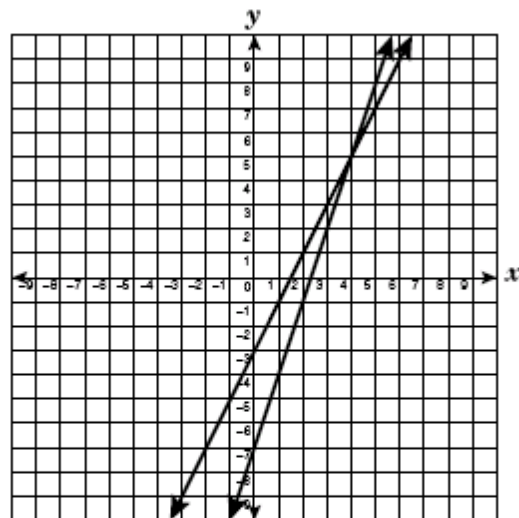
1. Solve the system by graphing:

$$x + y = -5$$

$$y = 2x + 4$$

2. Tickets to a local movie were sold at \$3.00 for adults and \$1.50 for students. If 420 tickets were sold for a total of \$1005.00, how many student tickets were sold?

3. The graphs of the linear equations $y = 2x - 3$ and $y = 3x - 7$ are shown below.



If $2x - 3 = 3x - 7$, what is the value of x ?

F 4

G 5

H 9

J 10

4. Solve the system using substitution.

$$x - 2y = 2$$

$$y = x + 1$$

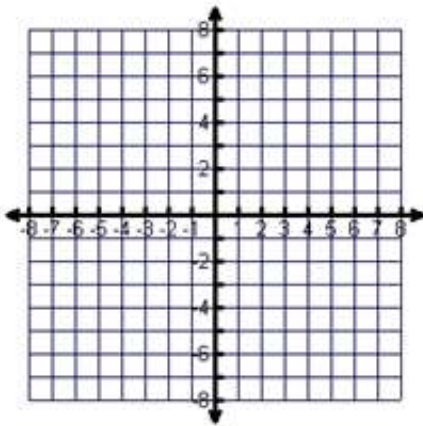
5. Solve: $4x + 3y = -11$

$$3x - 3y = -24$$

6. The length of a rectangle is 4 less than 3 times the width. If the perimeter of the rectangle is 168 inches, find its length.

G. Inequalities with two variables

1. Graph $2x - 3y \leq -24$



Is $(0, 0)$ a solution? _____

2. Which inequality is equivalent to:

$$7x - 2y > 8$$

A $y > \frac{7}{2}x + 8$

B $y > -\frac{2}{7}x + \frac{8}{7}$

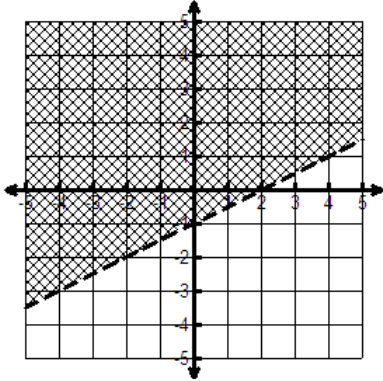
C $y < \frac{7}{2}x - 4$

D $y < -\frac{2}{7}x - \frac{4}{7}$

3. $(x, 2)$ is a solution to the inequality $y - 4 > -\frac{2}{3}(x + 6)$. Which of these is a possible value for x ?

- A** -5 **B** -3 **C** -1

4. An inequality is graphed below.



If the slope of the boundary line is multiplied by 6, what is the new inequality? _____

If the slope stays the same, but the line is shifted down 2 units, what is the new inequality?

If the slope is multiplied by -4 and the line is shifted up 5 units, what is the new inequality? _____

5. To compete in a piano competition, you need to perform two musical pieces whose combined duration is no greater than 15 minutes. Which inequality represents this situation?

- A** $x + y < 15$
B $x + y \leq 15$
C $x + y > 15$
D $x + y \geq 15$

6. You have two summer jobs. You earn \$8 per hour teaching basketball and \$10 per hour teaching swimming. Your goal is to earn at least \$200 per week.

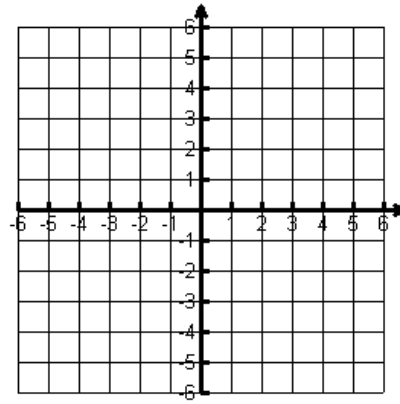
Write an inequality: _____

Can you work 15 basketball hours and 5 swimming hours and reach your goal?

7. A system of linear inequalities is represented below.

$$y \leq \frac{1}{2}x + 3$$

$$y > -\frac{1}{2}x + 3$$



H. Exponent rules

1. $(7.6)^0$

2. $\frac{x^{-2}}{y^{-9}}$

3. $a^{-5}(a^3)(a^{-6})$

4. $x^2 \cdot 4x^3 \cdot y^4 \cdot 4y^2$

5. $(4r^3s^4t^5)^4$

6. $x^{-6} \cdot x^{-5}$

7. $(3x^3y^{-2})^{-2}$

8. $\sqrt{175}$

Simplify

9. $\sqrt{20} \cdot \sqrt{6}$

10. $\frac{\sqrt{144}}{\sqrt{12}}$

11. $\sqrt{72x^9y^{10}}$

12. $3\sqrt{6}(\sqrt{6} - 2\sqrt{5})$

I. Polynomials

Factor the GCF:

1. $5x^2 + 35$

2. $4a^3b + 6ab^2 + 2a^2b$

3. Add: $(8g^4 + 9g^3 + 4) + (3g^4 - 7g - 5)$

4. Subtract: $(-6x^2 - 2x) - (7x - 3 - 5x^2)$

5. What is the perimeter of the rectangle with a length of $3x^2 + 5x$ units and a width of $2x - 1$?

Multiply.

6. $-3x^4(4x^2 - 3)$

7. $5x^2(3x + 2y)$

8. $(9x + 7)(x + 2)$

9. $(6x + 7)(5x^2 + 3x - 1)$

Factor.

10. $x^2 - 2x - 3$

11. $x^2 + 6x - 16$

12. $3x^2 - 14x + 8$

13. $64x^2 - 49$

Solve.

14. $x^2 + 4x - 5 = 0$

15. $3x^2 + 2x - 1 = 0$

16. $2x^2 + x = 15$

17. $x^2 = 36$

18. Solve using the quadratic formula. Simplify your answer. $4x^2 + 4x - 5 = 0$

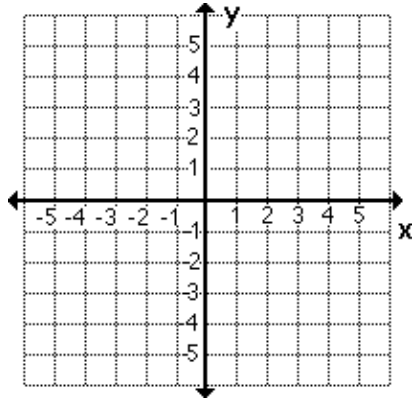
19. A flower garden has a length that is 4 ft. shorter than twice its width. The area of the garden is 48 square feet. Find the dimensions of the garden.

J. Quadratic Function

Graph $y = x^2$

(Parent function)

x	y



Vertex: _____ Max or Min?

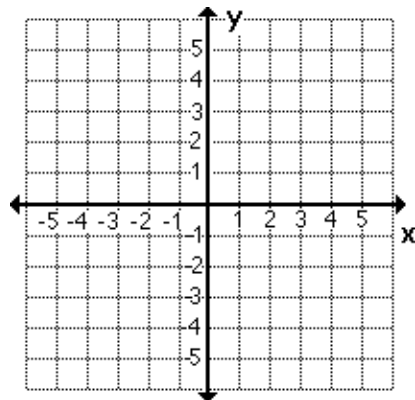
Axis of Symmetry: _____

x-intercepts: _____

y-intercept: _____

1. Graph $y = -2x^2$

x	y



Vertex: _____ Max or Min?

Axis of Symmetry: _____

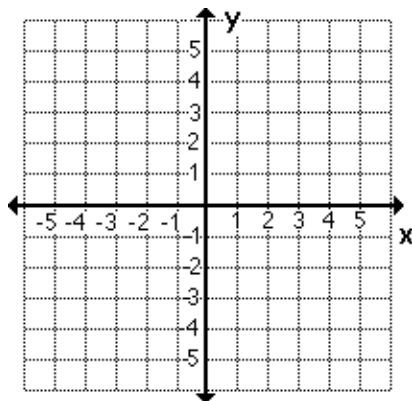
x-intercepts: _____

y-intercept: _____

How does this graph differ from the parent function?

2. Graph $y = -x^2 + 2$

x	y



Vertex: _____ Max or Min?

Axis of Symmetry: _____

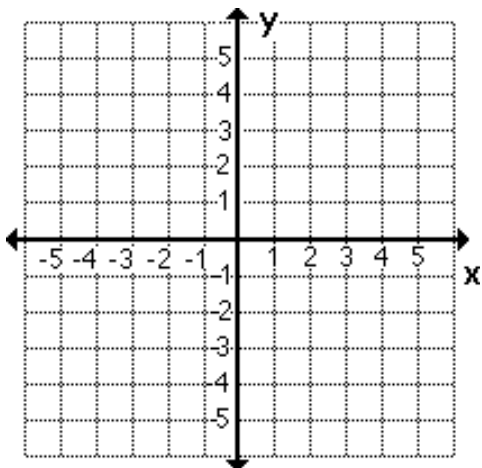
x-intercepts: _____

y-intercept: _____

How does this graph differ from the parent function?

Use $x = \frac{-b}{2a}$ to graph standard Quadratic equations

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



Vertex: _____ Max or Min?

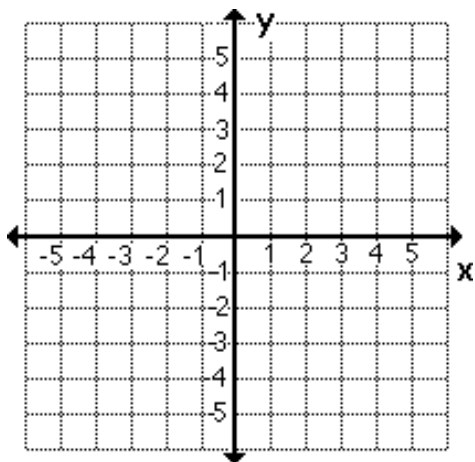
Axis of Symmetry: _____

x-intercepts: _____

y-intercept: _____

How does this graph differ from the parent function?

4. Graph $y = x^2 - 7x + 10$



Vertex: _____ Max or Min?

Axis of Symmetry: _____

x-intercepts: _____

y-intercept: _____

How does this graph differ from the parent function?