Applications of Quadratics

Agenda

Warm-up

Notes (p.111)

Activity

HW Practice #1-9

Reminders

See next slide

Warm-Up (Thursday)

Have out hw to check

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

24 What are the solutions to the equation $x^2 - 4x = -1$?

$$x^2 - 4x + 1 = 0$$

$a=1 \quad b=-4 \quad c=1$

$(-4)^2 - 4(1)(1) = 12$

$-(-4) = 4$

F $x = \frac{-4 \pm \sqrt{20}}{2}$

G $x = \frac{4 \pm \sqrt{12}}{2}$

H $x = \frac{-4 \pm \sqrt{12}}{2}$

J $x = \frac{4 \pm \sqrt{20}}{2}$

Applications of Quadratics

Game Plan:

Stamp HW ✓

Go over warm-up ✓

Check HW @ your table ←

Do one problem all together (p. 111)

Work on homework

I have an activity that will be due at the end of the period if you decide you don't want to use your time wisely....

Questions, Comments, Concerns?

Practice - Solving Quadratics **pp 652-659**

Name _____ Date _____ Period _____

Solve the equations below. Round solutions to the nearest hundredth, if necessary. State which method you used to solve.

1. $x^2+5x+6=0$

2. $x^2-3=2x$

3. $(x-5)^2=100$

$(x-5)^2-100=0$

4. $0=x^2-4$

5. $x(x+5)=y$

6. $x^2-5x=0$

7. $0=x^2+12$

8. $-3.2x^2-x+10=y$

9. Given $y=2x^2-6x-8$, find the following information below.

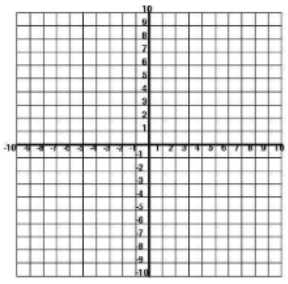
   a. Line of symmetry: _____

   b. Min/Max vertex: _____

   c. Solution(s): _____

   d. Graph the quadratic.

   e. Domain: _____ Range: _____



End of Six Weeks Reminders

THE 5TH SIX WEEKS ENDS FRIDAY 4/10.

30 ~~ENGLISH I STAAR~~	31 ~~ALGEBRA I SIMULATION~~	1 ~~AM Tutoring PM Tutoring Simulation Review Due WED SCHOOL~~	2 AM Tutoring	3 AM Tutoring Unit 8 Notebook Check Due - last call.
6 PM Tutoring Extra Credit Due x3	7 AM Tutoring HW 5.4-5.5 DUE Unit 9 Test HW 5.6 Due Notebook Check	8 AM Tutoring PM Tutoring Extra Credit Due WED SCHOOL	9 AM Tutoring Unit 8 Test Corrections due by 9AM Bathroom Passes Due	10 Grades Turned in 9AM Quiz HW 5.7 Due

RED - 5th Six Weeks BLUE - 6th Six Weeks

If you want to improve your grade, you will need to complete test corrections or make up & turn in any missing assignments by the listed date. Remember, if you are not eligible for test corrections, you must first attend a Wednesday school and have the teacher sign the corrections form. Please watch the videos before coming in for help.

Extra Credit opportunities at http://mskmathrhs.weebly.com

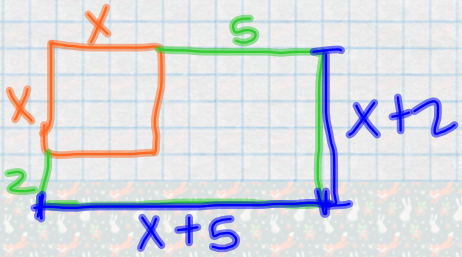
- Project (baseball cards, mathematician pamphlet, etc) (QZ)
- Special Products Video Notes (HW)
- Quadratic Formula Video Creation (QZ)
- Mixed STAAR Review questions (HW)

Applications of Quadratics

1. A square field had 5 meters added to its length and 2 meters added to its width. The field now has a new area of 130m². Find the length of the original field.

P. 111

STEP 1:
Draw & label picture.



STEP 2:
Write any relevant formulas.

$A_{rectangle} = L \cdot W$

$130 = (x+5)(x+2)$

STEP 3:
Plug in what you know.

	x	+5
x	x^2	5x
+2	2x	10

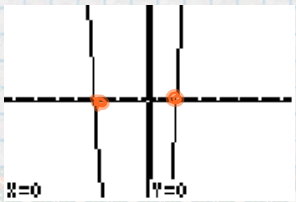
STEP 4:
Move everything to one side/distribute
ax^2+bx+c

$130 = x^2+7x+10$
$-130 \quad\quad -130$

$0 = x^2+7x-120$

graphing $y_2 = 0$

STEP 5:
Solve with your method of choice.



$x = \{-15, 8\}$

no negative lengths

STEP 6:
Check for reasonableness.

8 meters

Applications of Quadratics

SEND YOUR PAPER PATROL TO GET ONE OF EACH COLORED PAPER

EACH OF YOU NEEDS A DIFFERENT COLORED PAPER. WRITE YOUR TABLE NUMBER IN THE TOP LEFT AND YOUR NAME AS PERSON A.

Table # ____
Person A:
Person B:
Person C:
Person D:

YOU WILL HAVE A LIMITED AMOUNT OF TIME TO COMPLETE EACH STEP OF THE PROBLEM SOLVING PROCESS. THEN YOU WILL SWITCH PAPERS (CLOCKWISE) FOR ANOTHER TABLE MEMBER TO COMPLETE THE NEXT STEP.BE SURE TO CHECK THE PREVIOUS PERSON'S STEP.THIS WILL CONTINUE UNTIL EACH PROBLEM IS COMPLETED.

Applications of Quadratics

STEP 1 (PERSON A)

DRAW OR LABEL A PICTURE OF THIS SITUATION

STEP 2 (PERSON B)

WRITE YOUR NAME AS PERSON B
READ THE PROBLEM AND CHECK PERSON A'S WORK
THEN WRITE THE FORMULA/ EQUATION YOU NEED

STEP 3 (PERSON C)

WRITE YOUR NAME AS PERSON C
READ THE PROBLEM AND CHECK PERSON B'S WORK
THEN PLUG IN WHAT YOU KNOW

STEP 4 (PERSON D)

WRITE YOUR NAME AS PERSON d
READ THE PROBLEM AND CHECK PERSON C'S WORK
THEN PUT THE EQUATION IN STANDARD FORM

STEP 5 (PERSON A)

CHECK PERSON D'S WORK
THEN SOLVE

STEP 6 (PERSON B)

CHECK PERSON A'S WORK
THEN CHECK THE REASONABLENESS OF THE ANSWER

EVERYONE MUST AGREE ON AND INITIAL THE SOLUTION FOR EACH PROBLEM!!

Algebra 1 - Applications of Quadratics

2. A softball league has t teams and each team plays all the other teams in the league twice. The total number of games played, g, is shown by $g = t^2 - t$. If the Lady Cats softball league plays a total of 72 games, how many teams are in the league?

Table # ____
Person A:
Person B:
Person C:
Person D:

Person A: Draw or label a picture of this situation. Person B initials: _____
Person B: Write the Formula(s) that you need. Person C initials: _____
Person C: Plug in what you know. Person D initials: _____
Person D: Get everything on one side of the equation (standard form) Person A initials: _____
Person A: Solve. What method did you use? Person B initials: _____
Person B: Check reasonableness of solution. EVERYONE initials: _____

Algebra 1 - Applications of Quadratics

3. The length of a rectangle is 7 meters less than twice the width. Find the dimensions if the area is 60 square meters.

Table # ____
Person A:
Person B:
Person C:
Person D:

Person A: Draw or label a picture of this situation. Person B initials: _____
Person B: Write the Formula(s) that you need. Person C initials: _____
Person C: Plug in what you know. Person D initials: _____
Person D: Get everything on one side of the equation (standard form) Person A initials: _____
Person A: Solve. What method did you use? Person B initials: _____
Person B: Check reasonableness of solution. EVERYONE initials: _____

Algebra 1 - Applications of Quadratics

4. Suppose a person is riding in a hot-air balloon, 144 feet above the ground. He drops an apple. The height of the apple above the ground is given by the formula $h = -16t^2 + 144$, where h is height in feet and t is time in seconds. How long does it take the apple to hit the ground?

Table # ____

Person A:
Person B:
Person C:
Person D:

Person A: Draw or label a picture of this situation. Person B initials: _____
Person B: Write the Formula(s) that you need. Person C initials: _____
Person C: Plug in what you know. Person D initials: _____
Person D: Get everything on one side of the equation (standard form) Person A initials: _____
Person A: Solve. What method did you use? Person B initials: _____
Person B: Check reasonableness of solution. EVERYONE initials: _____

Algebra 1 - Applications of Quadratics

5. The volume, V, of a cylinder is given by the formula $V = \pi r^2 h$, where r is the radius of the cylinder and h is the height. A cylinder with height of 10 ft has a volume of 140 ft^3. To the nearest tenth of a foot, what is the radius of the cylinder?

Table # ____
Person A:
Person B:
Person C:
Person D:

Person A: Draw or label a picture of this situation. Person B initials: _____
Person B: Write the Formula(s) that you need. Person C initials: _____
Person C: Plug in what you know. Person D initials: _____
Person D: Get everything on one side of the equation (standard form) Person A initials: _____
Person A: Solve. What method did you use? Person B initials: _____
Person B: Check reasonableness of solution. EVERYONE initials: _____

HW #1-9...show your work!!! OMIT 2, 5

Algebra I - Unit 9: Topic 4 – Applications of Quadratics

Practice – Applications of Quadratics **pp 622-641**

Name _____ Date _____ Period _____

1. An apple drops off the apple tree from a height of 8 feet. How long does it take to reach the ground? Use the function $f(t) = -16t^2 + 8$ where t is the time in seconds from when the apple was dropped, to find the answer.

   A 0.5 seconds
   B 0.71 seconds
   C 1 second
   D 2.23 seconds

Write an equation for each, then solve.

2. The length of a photograph is 1 cm less than twice the width. The area is 45 cm^2. Find the dimensions of the photograph.

3. If the area of a rectangular garden is represented by the equation $2w^2 + w = 36$ where w is the width of the garden. What is the width of the garden in meters?

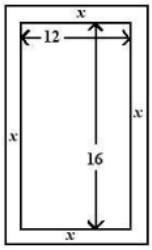
4. The length of a rectangle is twice the width. The area is 50 square inches. Find the dimensions of the rectangle.

5. The product of two consecutive even integers is 168. Find the integers.

OMIT

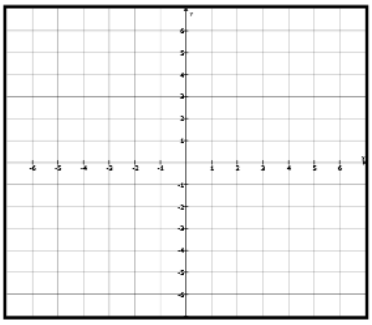
Algebra I - Unit 9: Topic 4 – Applications of Quadratics

6. A garden measuring 12 meters by 16 meters is to have a pedestrian pathway installed all around it, increasing the total area to 285 square meters. Write an equation in standard form that could be used to determine the width of the pathway. {Do not solve.}



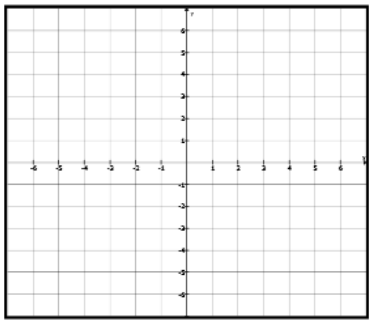
7-8. Graph each quadratic equation below, then fill in the information.

7. Graph the equation $y = x^2 - 2x - 3$.



Vertex: _____
Maximum or Minimum?
Concave Up or Concave Down?
Solution(s): _____
Domain: _____
Range: _____

8. Graph the equation $y - 9 = x^2 - 6x$



Vertex: _____
Maximum or Minimum?
Concave Up or Concave Down?
Solution(s): _____
Domain: _____
Range: _____

9. The circles below show a pattern.

Stage 1	
Stage 2	○ ○
Stage 3	○ ○ ○ ○ ○ ○
Stage 4	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

Which expression can be used to determine the number of circles at stage n?

A $n - 1$
B $2n - 1$
C $n^2 - 1$
D $n^2 - n$

HW Help: Applications of Quadratics

NO WORK = NO CREDIT = NO KIDDING!!

1. Plug in 0 for f(t). Then solve using either the calculator or square root method.
2. Draw a picture! Your equation should be w(2w−1)=45. Make sure you distribute and move the 45 over before solving. Remember: There are no negative widths!
3. Move the 36 over...then solve!
4. Again, draw a picture! your equation should be w(2w) = 50. Use the square root method!
5. OMIT
6. You are not solving this equation. If the width of the path measures x all the way around, then the new width would be (2x + 12) and the new length will be (2x + 16). Area = length times width, so use your "window box" to multiply!

7 & 8 Make sure the equation says y=, then use your blue book!

9. Count the number of circles in each stage. Then try to plug in stage 4 (n=4) to each answer choice to see which equation gives you the correct number of circles. HINT: the equation should be quadratic!!