Applications of Quadratics

Agenda

WARM-UP
NOTES (P.114)
ACTIVITY
GRADE CHECK
HW (2 PAGES)

Reminders

- ALL LATE HW DUE WED
- EXTRA CREDIT DUE WED
- BATHROOM PASSES DUE THURS (MAKE SURE YOUR NAME AND PERIOD IS ON EACH ONE IF SEPARATED)
- TEST & NOTEBOOK CHECK FRIDAY

Warm-Up (Monday)

1. A function is described by the equation $f(x) = \frac{2}{3}x^2 - 2x - 3$.

   The replacement set for the independent variable is {0, 6,-12,-21}. What is the corresponding set for the dependent variable?

   a. {-3, 1, 9, 21}
   b. {-3, -2, -1, 0}
   c. {-3, 9, 117, 333}
   d. {-3, -3, 9, 33}

2. If the slope of a line changes from -5 to $-\frac{1}{5}$ and the y-intercept changes from -2 to 0, then the graph of the line will be affected in which of the following ways?

   a. Less steep; up 2 units
   b. Less steep; down 2 units
   c. Steeper; up 2 units
   d. Steeper; down 2 units

$y = mx + b$

$y_1 = -5x - 2$

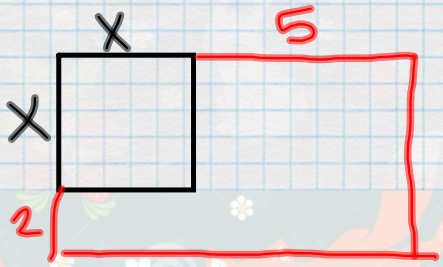
$y_2 = -\frac{1}{5}x$

Applications of Quadratics

P. 114

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.

STEP 1:



STEP 2:

$A = lw$

(in problem)

STEP 3:

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

STEP 4:

	$x+5$
x	x^2 | $5x$
$+2$	$2x$ | 10

ax^2+bx+c

1) multiply 2) Add/subt.

$130 = x^2+7x+10$

$-130 \quad -130$

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

STEP 5:

solve by graphing

$y_2 = 0$

$\{8, -15\}$

length isn't neg.

length = 8 m

STEP 6:

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 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.

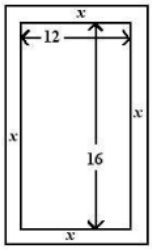
3. If the area of a rectangular garden is represented by the equation $2w^2 + w = 36$ where w is the width of the garden. What is the width of the garden in meters?

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.

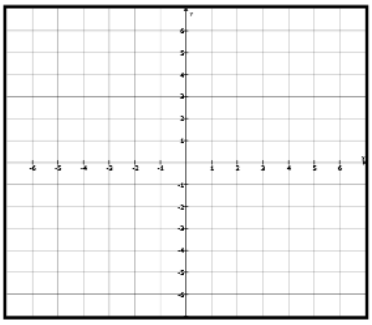
Algebra I - Unit 9: Topic 4 – Applications of Quadratics

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.}



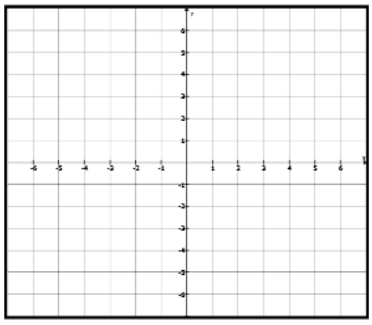
7-8. Graph each quadratic equation below, then fill in the information.

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 $y - 9 = x^2 - 6x$



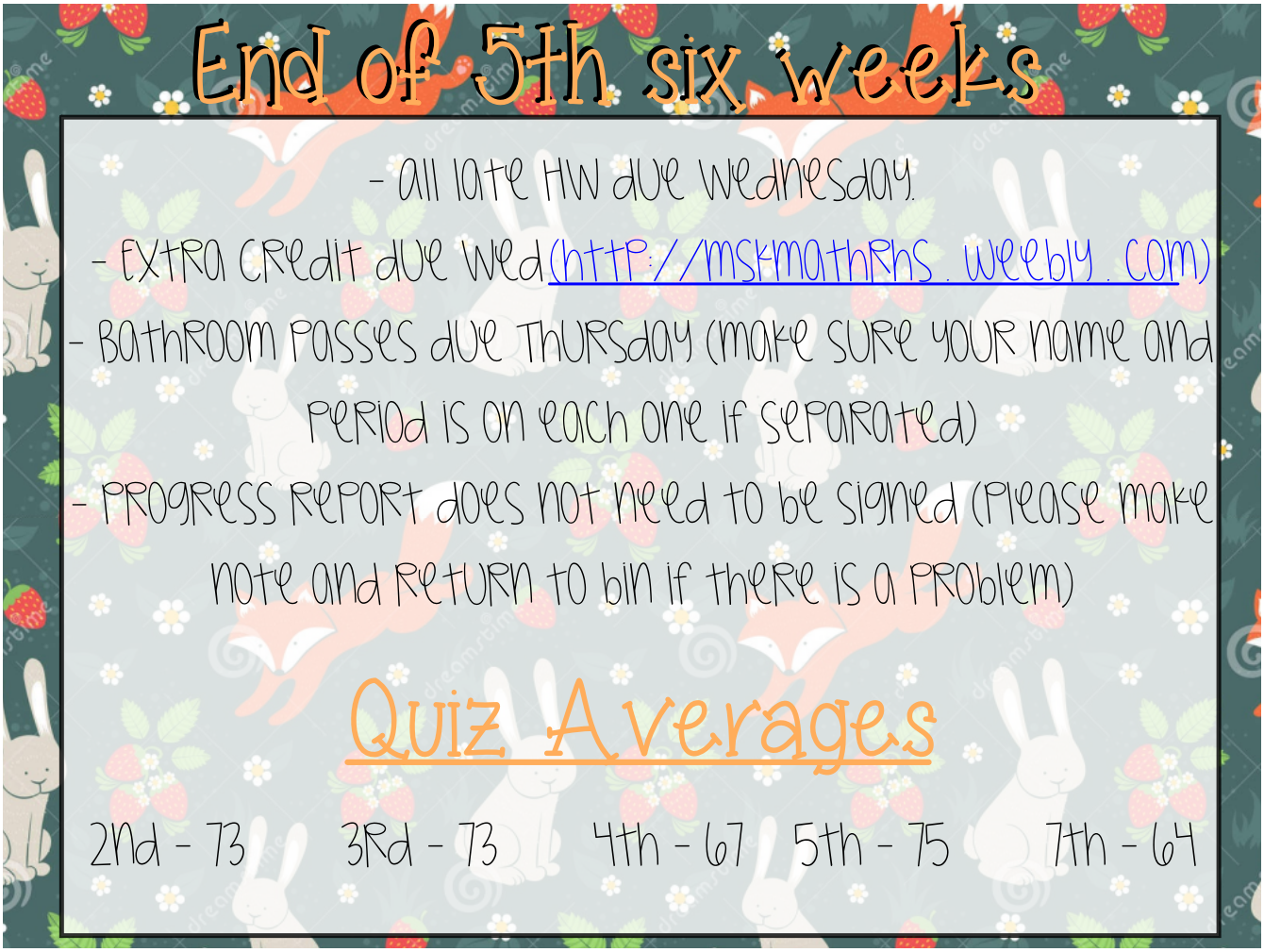
Vertex: _____
Maximum or Minimum?
Concave Up or Concave Down?
Solution(s): _____
Domain: _____
Range: _____

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


End of 5th six weeks
- All late HW due Wednesday
- Extra Credit due Wed (http://msKmathRhS.weebly.com)
- Bathroom passes due Thursday (make sure your name and period is on each one if separated)
- Progress Report does not need to be signed (Please make note and return to bin if there is a problem)
Quiz Averages
2nd - 73
3rd - 73
4th - 67
5th - 75
7th - 64

Algebra 1 - Applications of Quadratics

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

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?

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

Table # ____

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

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?

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

Table # ____

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

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?

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: _____