Name________________________

Date_______________

Unit 4: Quadratics

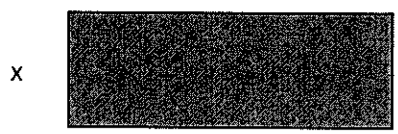
Applications Assignment #18

Key point: When solving quadratic applications we are only interested in any real solutions. If the resulting quadratic equation has no real roots, then the problem has not real solutions.

We should always check our answers to make sure they are reasonable. For example:

- If we are finding a length then it must be positive and we reject any negative solutions.
- If we are finding how many people, then clearly the answer must be an integer.

1) A rectangle has length 3cm longer than its width. Its area if 42 cm^2. Find the width



Let x stand for the width Then how can we write an expression for the length in terms of x?

2) Two integers differ by 12 and the sum of their squares is 74. Find the integers.

Let x stand for the bigger integer How do you write the other integer, in terms of x?

3) The sum of a natural number (1,2,3,4,...) and its square is 210. Find the number.

4) The product of two consecutive even numbers is 360. Find the numbers.

5) You have 200 feet of material to make a rectangular fence.

a) Make a sketch of the rectangle and label the sides

b) What is the quadratic expression to represent the area?

c) What is the maximum area

d) What are the dimensions of the rectangle that has the maximum area?

6) You have 300 feet of material to make a rectangular fence. You will be using 1 side of an existing wall, so you only need to split your material three ways.

a) Make a sketch of the scenario

b) What is the quadratic expressions to represent the area?

c) What is the maximum area?

d) What are the dimensions of the rectangle that has the maximum area?

7) The total cost of producing "x" toasters per day is given by C=($\frac{1}{10}x^2$+20x +25), and the selling price of each toaster is ($44-\frac{1}{5}$x). The total profit equation can be modeled by P=$\frac{-3}{10}x^2$+24x – 25 How may toasters should be produced each day in order to maximize the total profit? (Hint: This is exactly like the lemonade warm-up problem. The vertex is the optimal point. What is your vertex strategy?)

High Challenge would be for you to show how the profit equation was produced given the 2 other functions.

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