

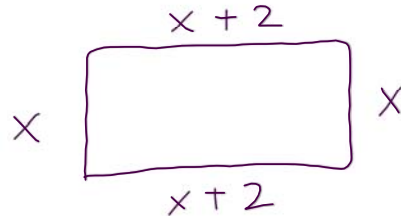
Name: _____

Date: _____

Quadratic Word Problems (and their Geometric Applications)!

Do Now:

In the space below, create a sketch of a **rectangle** of width x and length 2 meters more than the width.



$$A = L \cdot W$$

$$A = (L)(W)$$

$$A = x(x+2)$$

$$= x^2 + 2x$$

Sketches like these are **extremely** important when it comes to solving quadratic word problems. Let's practice!

Example 1: A school is building a rectangular soccer field that has an area of 6000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.

6000 yds^2

\times

$$0 = x^2 + 40x - 6000$$

$$0 = (x-60)(x+100)$$

$$0 = x-60 \quad 0 = x+100$$

$$x = 60 \quad x = -100$$

reject

\times

$A = (L)(W)$

$W \rightarrow 60 \text{ yds}$
 $L \rightarrow 100 \text{ yds}$

$$6000 = x(x+40)$$

$$-6000 \quad -6000$$

$$0 = x(x+40) - 6000$$

Example 2: Find all sets of two consecutive integers such that their product is eight less than ten times the smaller integer.

let $x = 1^{\text{st}}$ consecutive integer
 let $x+1 = 2^{\text{nd}}$ consecutive integer

8 and 9
or
1 and 2

$$x(x+1) = 10x - 8$$

$$x^2 + x = 10x - 8$$

$$\underline{-10x} \quad \underline{-10x}$$

$$x^2 - 9x = -8$$

$$\underline{+8} \quad \underline{+8}$$

$$x^2 - 9x + 8 = 0$$

Get this equal to zero

$$x^2 - 9x + 8 = 0$$

$$(x-8)(x-1) = 0$$

$$x = 8 \quad x = 1$$