Maximum Area of a Rectangle Using Quadratics



Rectangle

* Quadrilateral with two pairs of opposite equal sides which are also parallel
* All angles are equal to 90 degrees
* Diagonals are equal in length and bisect one another

**Perimeter: 2L + 2W**

**Area: L \* W**

What is the maximum area of a rectangle with a perimeter of 60.

$$2L+2W=60$$

$$\frac{2L}{2}+ \frac{2W}{2}= \frac{60}{2}$$

$$L+W=30$$

$$ -W -W$$

$$L=30-W$$

$$A=L\*W$$

$$A=\left(30-W\right)\*W$$

$$A=30W- W^{2}$$

$$A= -W^{2}+30W$$

$$W= \frac{-b}{2a}$$

$$W= \frac{-30}{-2}=15$$

$$A=30\left(15\right)- (15)^{2}$$

$$A=450-225=225$$

**Step 1**

**When given the perimeter, create an equation using your formula.**

**Step 5**

**Find the maximum**

**Step 4**

**Determine the axis of symmetry**

**Step 3**

**Multiply your two side lengths using the area formula**

**Step 2**

**Put all information in terms of one variable.**

* **This means isolating length or width**