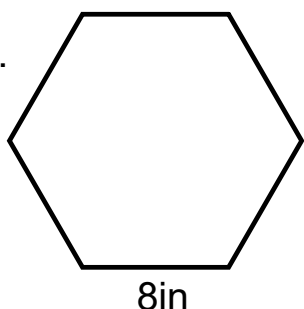


Warm Up:

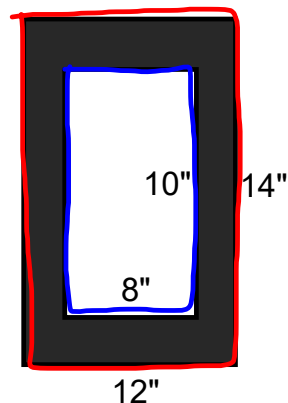
Find the area:

1. octagon
a = 6.7
s = 12

2.



3. Find the shaded area:



$$12 \cdot 14 = 168$$

$$8 \cdot 10 = 80$$

$$168 - 80 = 88$$

Learning Goal: Today I will learn how to use quadratics to solve for the area of a shape.

Success Criteria: I am able to set up and solve an equation in factored form.

Area Using Quadratics

You want to find the area of the frame around a picture.
Write a polynomial expression to represent the area of the frame.
(Simplify, but do not solve!)

$$A = bh$$

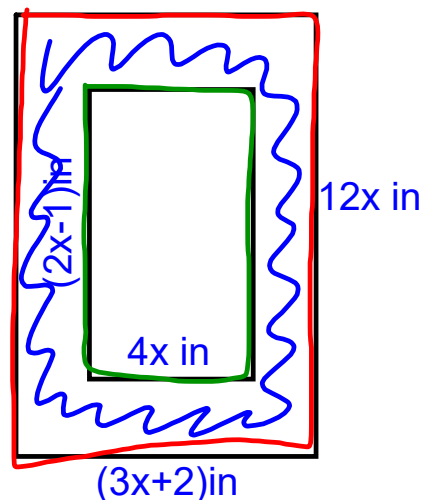
$$(3x+2)12x = 36x^2 + 24x$$

$$4x(2x-1) = 8x^2 - 4x$$

$$(36x^2 + 24x) - (8x^2 - 4x)$$

$$\underline{36x^2 + 24x} - \underline{8x^2 - 4x}$$

$$\underline{28x^2 + 28x}$$



Find the dimensions:



$$A = bh$$

$$126 = (x+1)(x+6)$$

$$126 = x^2 + 6x + x + 6$$

$$126 = x^2 + 7x + 6$$

$$\begin{array}{r} -126 \\ -126 \end{array}$$

$$0 = x^2 + 7x - 120 \quad \text{Factor!}$$

$$(x-8)(x+15)$$

$$\begin{array}{r} x-8=0 \\ +8 \quad +8 \end{array}$$

$$x=8$$

$$\begin{array}{r} x+15=0 \\ -15 \quad -15 \end{array}$$

$$\cancel{x=-15}$$

Dimensions:

$$x+1 = 8+1 = 9$$

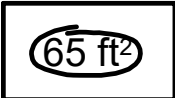
$$x+6 = 8+6 = 14$$

$$\underline{9 \text{ by } 14}$$

$$\begin{array}{r} 120 \\ 1 \cdot 120 \\ 2 \cdot 60 \\ 3 \cdot 40 \\ 4 \cdot 30 \\ 5 \cdot 24 \\ 6 \cdot 20 \\ 8 \cdot 15 \\ 10 \cdot 12 \end{array}$$

Burrito Books

Area Using Quadratics 10-11

<p align="center"><u>Area using Quadratics</u></p>	
 <p>65 ft^2</p> <p>$x+3$</p> <p>$x-5$</p>	<p>Find the dimensions of the rectangle.</p>
<p>1. Write the area formula. Substitute what you know.</p> <p align="center">$A = b \cdot h$</p> <p align="center">$65 = (x+3)(x-5)$</p>	
<p>2. To solve, the equation <u>must</u> be equal to zero. <u>Multiply (distribute / FOIL)</u> then move area to the other side.</p> <p>$65 = (x+3)(x-5)$ Distribute</p> <p>$65 = x^2 - 5x + 3x - 15$ Simplify</p> <p>$65 = x^2 - 2x - 15$</p> <p>$-65 \quad -65$</p> <p>$0 = x^2 - 2x - 80$ set = 0</p>	
<p>3. Factor</p> <p>$0 = x^2 - 2x - 80$</p> <p>$0 = (x+8)(x-10)$</p>	<p>Factors</p> <p align="center">80</p> <p align="center"> \swarrow \searrow </p> <p>1·80</p> <p>2·40</p> <p>3</p> <p>4·20</p> <p>5·16</p> <p>6</p> <p>7</p> <p>8·10</p> <p>9</p>
<p>4. Set each factor equal to zero and solve for x.</p> <p>$x+8=0$ $x-10=0$</p> <p>$x = -8$ $x = 10$</p>	
<p>5. Use the positive solution to find the dimensions.</p> <p><u>base:</u> <u>height:</u></p> <p>$x + 3 = 10 + 3$ $x - 5 = 10 - 5$</p> <p>$= 13$ $= 5$</p> <p align="center">13 x 5</p>	

Closure: Today I learned how to use quadratics to find the area of a rectangle.