Stick Quiz

Simplify

1. $\sqrt{-125} = 5i\sqrt{5}$

2. $\frac{-2i}{(3+5i)} = -\frac{10}{34} - \frac{6i}{34} = -\frac{5}{17} - \frac{3i}{17}$

3. $i^{35} = -i$

4. Solve: $(2x - 3)(x + 4)=0$

$x = 3/2, -4$

$\frac{(-2i)}{(3+5i)} \cdot \frac{(3-5i)}{(3-5i)} = \frac{-6i+10i^2}{34} = \frac{-10-6i}{34}$

$3(3-5i)+5i(3-5i)$

$9-15i+15i-25i^2$

$9-25(-1)$

$9+25$

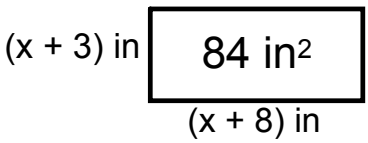
$= \frac{-10}{34} - \frac{6i}{34}$

$-\frac{5}{17} - \frac{3i}{17}$

Questions On Homework

Factoring: Application to geometric problems.

Find *x* and the side lengths of the rectangle.



Recall: A=bh

Recall: We can only set each part of a factored equation = to zero if it is ACTUALLY = to zero!

Answer:

I can... complete the square and find the roots/ solutions/zeros for a quadratic.

Day 1: Perfect Squares & Perfect Square Trinomials

Know the Perfect Squares

Make the following table and complete on your own. You are expected to have the first 12 perfect squares memorized.

x	$x^2=$
1	$1^2=1$
2	$2^2=4$
3	$3^2=9$
4	
5	...

Other Perfect Squares:

x^2 Why? $x^2=xx$

$9x^2$ Why? $9x^2=3*3*xx$

$(x-7)^2$ Why? $(x-7)^2=(x-7)(x-7)$

Factor the following:

1. $x^2 + 20x + 100 = (x+10)(x+10) = (x+10)^2$
2. $x^2 - 10x + 25 = (x-5)(x-5) = (x-5)^2$
3. $x^2 + 6x + 9 = (x+3)(x+3) = (x+3)^2$
4. $x^2 + 8x + 16$
5. $x^2 - 12x + 36$

1. $(x+10)(x+10) = (x+10)^2$
2. $(x-5)(x-5) = (x-5)^2$
3. $(x+3)(x+3) = (x+3)^2$
4. $(x+4)(x+4) = (x+4)^2$
5. $(x-6)(x-6) = (x-6)^2$

What do you notice about EACH one of these?

1. $x^2 + 20x + 100$
2. $x^2 - 10x + 25$
3. $x^2 + 6x + 9$
4. $x^2 + 8x + 16$
5. $x^2 - 12x + 36$

Angela: Students should see that the first and last term are positive and perfect squares. If they notice the second term is twice the square root of the first and last they are rock stars! This will help in later chapters!

This is an example of a Perfect Square Trinomial because it factors into a binomial squared.

$$x^2 + 20x + 100 = (x + 10)^2$$

Perfect Square Trinomial = binomial squared

Why are these helpful?

Because we can take the square root of a perfect square and we get an answer that we can work with.

$$\sqrt{4} = 2$$

$$\sqrt{2^2} = 2$$

$$\sqrt{x^2} = x$$

$$\sqrt{36x^2} = 6x$$

$$\sqrt{(x+2)^2} = (x+2)$$

You can't get an answer like this:

$$\sqrt{x^2 + 3x + 2} = YUCK$$

Solve each equation using square roots.

Ready to go:

1. $\sqrt{(x+1)^2} = \sqrt{9}$

$x+1 = \pm 3$

$-1 \quad -1$

$x = -1 \pm 3$

$x = -1+3 = 2$

$x = -1-3 = -4$

2. $\frac{2(x-7)^2}{2} = \frac{10}{2}$

$\sqrt{(x-7)^2} = \sqrt{5}$

$x-7 = \pm\sqrt{5}$

$+7 \quad +7$

$x = 7 \pm \sqrt{5}$

$x = 7+\sqrt{5}$

$x = 7-\sqrt{5}$

You Try

1. $(x-2)^2 = 16$

2. $3(x+5)^2 - 2 = 9$

$+2 \quad +2$

$\frac{3(x+5)^2}{3} = \frac{11}{3}$

$\sqrt{(x+5)^2} = \sqrt{\frac{11}{3}}$

$x+5 = \pm\sqrt{\frac{11}{3}}$

$-5 \quad -5$

$x = -5 \pm \sqrt{\frac{11}{3}}$

$x = -5+\sqrt{\frac{11}{3}}$

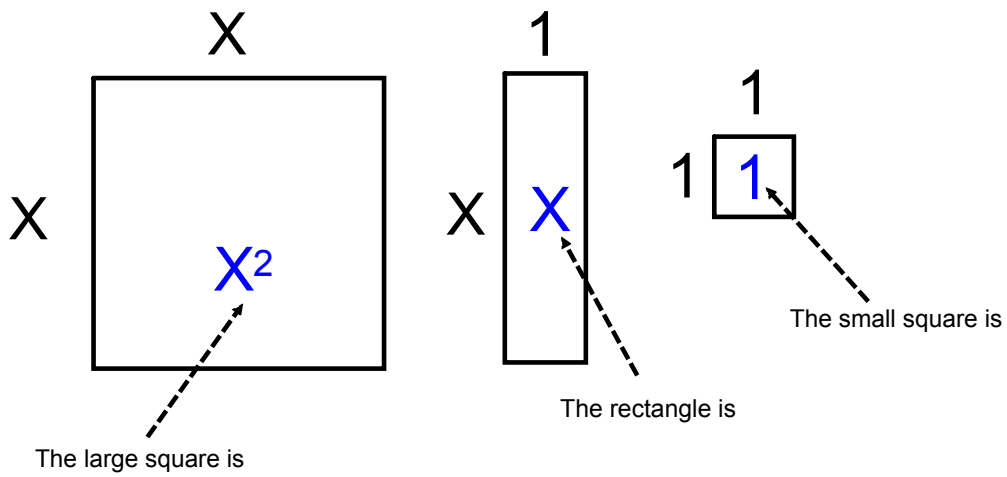
$x = -5-\sqrt{\frac{11}{3}}$

$(x-3)^2 = 5$

COMPLETING THE SQUARE

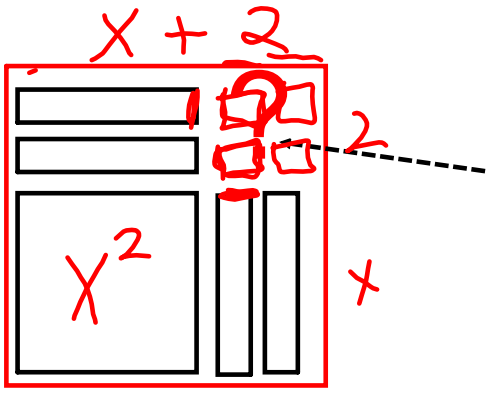
Long side is x units long

Short side is 1 unit long



Soooo.....

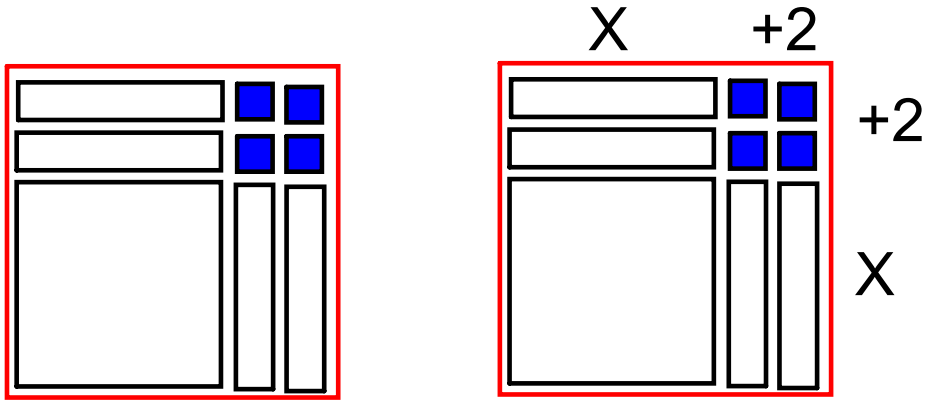
In this red square there is 1 x^2 and 4 x's



What could we add to complete the square ?

Remember the edges of each shape must be the same

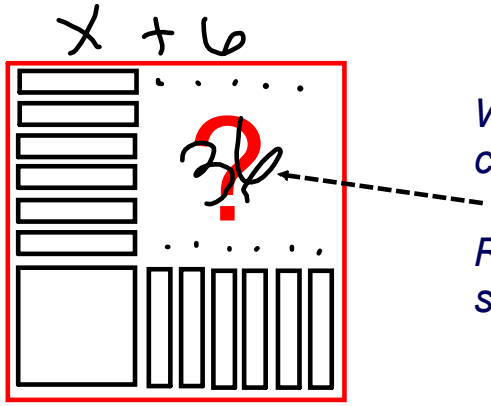
$X^2 + 4X + 4 = (X+2)^2$



$X^2 + 4X + 4 = (X + 2)(X + 2) = (X + 2)^2$

Soooo.....

In this red square there is 1 x^2 and 12 x's

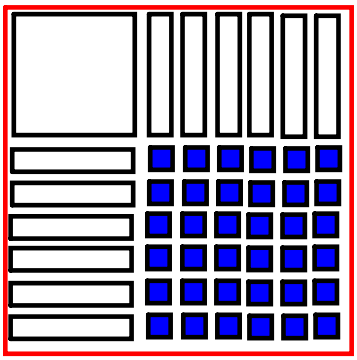


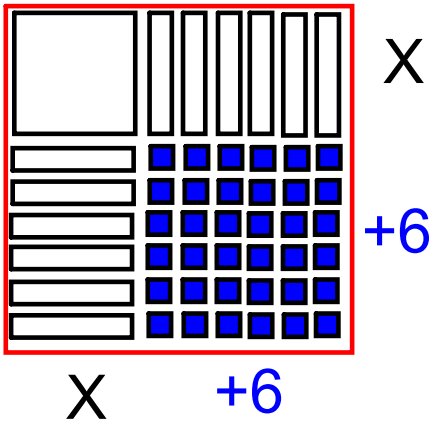
What could we add to complete the square ?

Remember the edges of each shape must be the same

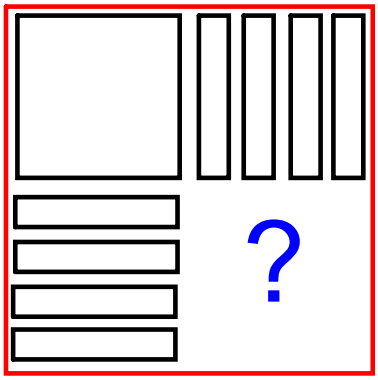
$X^2 + 12X + 36 = (X + 6)^2$

$X^2 + 12X + 36 = (X + 6)(X + 6)$

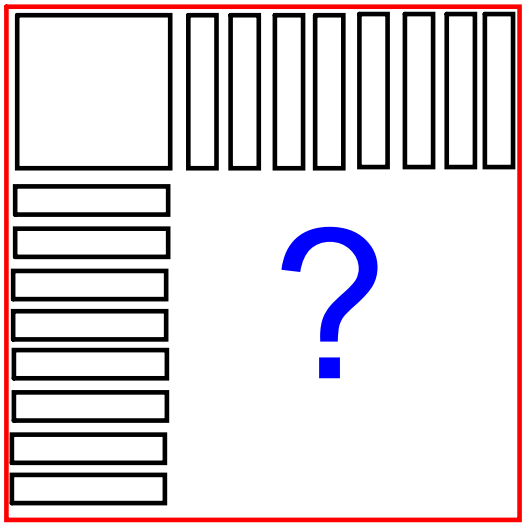




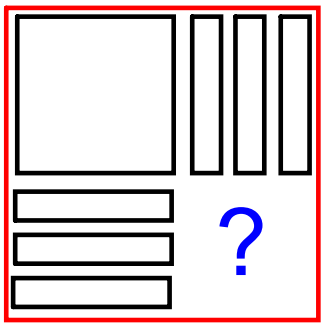
$X^2 + 8X + ?$



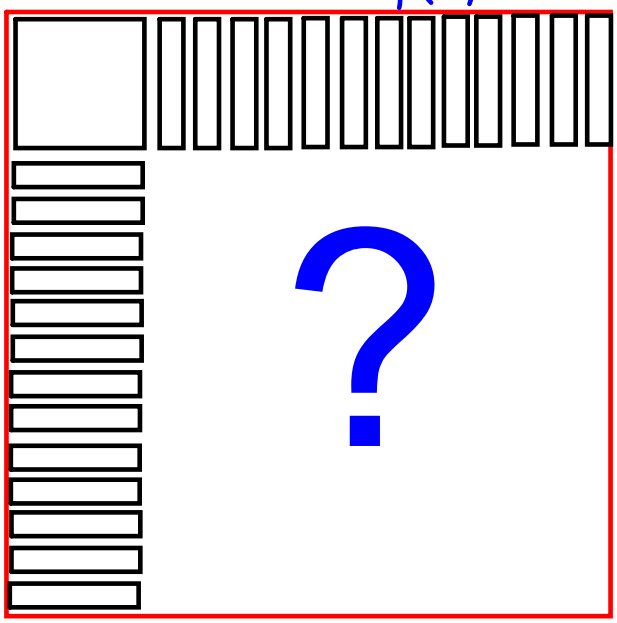
$X^2 + 16X + ?$



$X^2 + 6X + 9$?



$X^2 + 26X + 169$



So What's the rule?

$$c = \left(\frac{b}{2}\right)^2$$

Completing the Square

Divide b by 2 then square

The perfect square trinomial can then be written as a squared binomial.

$x^2 + 10x + \underline{\left(\frac{b}{2}\right)^2} = (x + \frac{b}{2})^2$

$x^2 + 6x + \underline{9} = (x + \underline{3})^2$

$\frac{10}{2} = 5$ $5^2 = 25$

$\frac{b}{2}$

$\left(\frac{b}{2}\right)^2$

$c = \left(\frac{b}{2}\right)^2$

6. $x^2 - 3x$

You Try:

$c = \left(\frac{b}{2}\right)^2$

$x^2 + 12x + \_\_\_\_\_ = (\quad)^2$

$x^2 - 16x + \underline{64} = (x-8)^2$

$(x-8)(x-8)$

Fractions?!?!?!? Leave them that way!

$c = \left(\frac{b}{2}\right)^2$

$x^2 + 3x + \frac{9}{4} = (x + \frac{3}{2})^2$

$c = \left(\frac{3}{2}\right)^2 = \frac{9}{4}$

$c = \left(\frac{3}{2}\right)\left(\frac{3}{2}\right)$

Fractions?!?!?!? Leave them that way!

$c = \left(\frac{b}{2}\right)^2$

$x^2 + \frac{1}{2}x + \frac{1}{16} = (x + \frac{1}{4})^2$

Dividing by two is the same as multiplying by 1/2!

$c = \left(\frac{1}{2} \cdot \frac{1}{2}\right)^2 = \left(\frac{1}{4}\right)^2 = \frac{1}{16}$

$\frac{\frac{1}{2}}{2} = \frac{1}{2} \cdot \frac{1}{2}$

$(x + \frac{1}{4})(x + \frac{1}{4})$

You Try:

$x^2 + 5x + \_\_\_\_ = (\qquad)^2$

$c = \left(\frac{b}{2}\right)^2$

Homework 4.5

Pg. 1 of 4.5 Note Packet