Warm up

Factor ① $4x^4 - 28x^3 + 48x^2$ ② $4x^2 - 169$

Find Roots

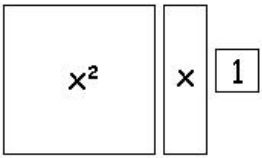
③ $10x^3 + 29x^2 = 3x$ ④ $9x^2 = 225$

GSE Algebra 1

8.4 - Complete the Square

Name: _____

We are going to use the following "tiles" below to help us understand complete the square. Use your imagination.



1.) Review factoring with the following problems.

A.) x^2+2x+1

$(x+1)(x+1)$

B.) x^2+4x+4

$(x+2)(x+2)$

C.) x^2+6x+9

$(x+3)(x+3)$

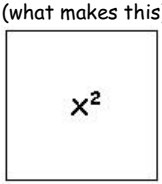
$(x+3)^2$

D.) $x^2+8x+16$

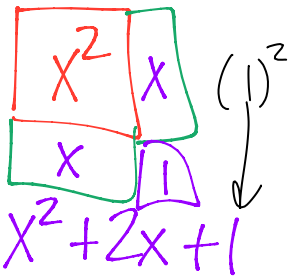
$(x+4)(x+4)$

Perfect Square Trinomial

2.) x^2 is already a complete square. You can see that represented with algebra tiles. (what makes this)

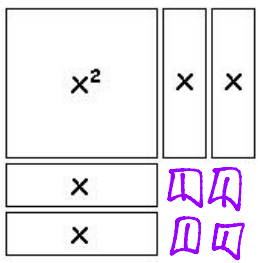


3.) x^2 + 2x isn't a complete square. How much do we need to add to it to "complete" it?



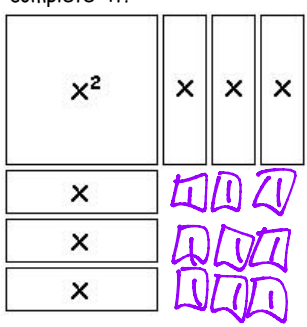
x^2+2x+1

4.) x^2 + 4x isn't a complete square. How much do we need to add to it to "complete" it?



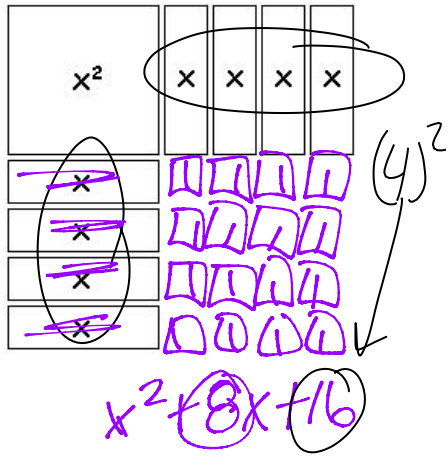
x^2+4x+4

5.) x^2 + 6x isn't a complete square. How much do we need to add to it to "complete" it?



x^2+6x+9

6.) x^2 + 8x isn't a complete square. How much do we need to add to it to "complete" it?



$x^2+8x+16$

7.) Have you found a pattern yet?

$\frac{1}{2}b \rightarrow$ then square # to get C

8.) Complete the squares:

$x^2+\frac{10x}{2}+25$ $(5)^2$ $(x+5)(x+5)$

$x^2+\frac{14x}{2}+49$ $(7)^2$

$x^2+\frac{3x}{2}+2.25$ $(1.5)^2$

$x^2+\frac{bx}{2}+\frac{b^2}{4}$ $\left(\frac{b}{2}\right)^2=\frac{b^2}{4}$

$x^2+18x+\frac{18^2}{4}$

$x^2+18x+81$

Practice completing the square.

$x^2 - 14x + \_\_\_\_\_$

$x^2 - 12x + \_\_\_\_\_$

$x^2 + 4x + \_\_\_\_\_$

$x^2 - 9x + \_\_\_\_\_$

$x^2 + 20x + \_100\_$

$x^2+20x+100$

$(x+10)(x+10)$

$x^2 - 30x + \_225\_$

$x^2 - \frac{11}{2}x + \_30.25\_$

$(-5.5)^2$

$x^2 - \frac{15}{2}x + \_56.25\_$

$(-7.5)^2$

$x^2 + \frac{1}{2}x + \_0.25\_$

$(\frac{1}{2})^2 = 0.25$

Before you divide the middle term by 2, you need to take out the GCF. For these, it is ONLY going to be a NUMBER. Let's do the first one to show you how to complete the rest.

A is not 1, you must take out GCF

$\frac{2x^2}{2} - \frac{4x}{2} + \_\_\_\_\_$

$2(x^2 - \frac{2x}{2} + 1)$

$(-1)^2 = 1$

$\frac{5x^2}{5} + \frac{20x}{5} + \_\_\_\_\_$

$5(x^2 + \frac{4x}{2} + 4)$

$(2)^2 = 4$

$5(x+2)(x+2) = 5(x+2)^2$

$\frac{3x^2}{3} - \frac{15x}{3} + \_\_\_\_$

$3(x^2 - \frac{5x}{2} + 6.25)$

$(-2.5)^2$

$4(x-3)(x-3)$

$\frac{4x^2}{4} - \frac{24x}{4} + \_\_\_\_\_$

$4(x^2 - \frac{6x}{2} + 9)$

$(-3)^2 = 9$

$\frac{10x^2}{10} + \frac{10x}{10} + \_\_\_\_\_$

$10(x^2 + \frac{x}{2} + 0.25)$

$(\frac{1}{2})^2 = 0.25$