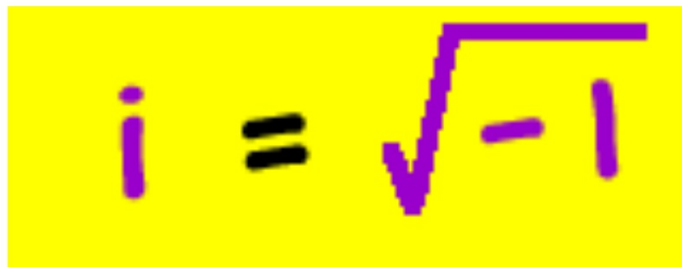**December 18, 2017**

Warm Up

Solve:

$$0 = 5x^2 + 8x + 5$$

Complex and Imaginary Numbers

You've been told (even by me) that you couldn't take the squareroot of a negative number because there is no solution. Well, actually, yes, there IS an answer!

(Try to calm down -- I know this is terribly exciting.) The answer is imaginary. No, I'm not making this up.

$$i = \sqrt{-1}$$

Since $i = \sqrt{-1}$

Squaring both sides gives

$$i^2 = -1$$

$$\sqrt{-4}$$

$$\sqrt{-4} = \sqrt{(4)(-1)} = \sqrt{4}\sqrt{-1} = 2i$$

$$\sqrt{-25} = 5i$$

$$\sqrt{-49} = 7i$$

$$\sqrt{-13} = \sqrt{13}\,i$$

Factor: $x^2 - 9$

$= (x+3)(x-3)$

Factor: $x^2 + 9$

$x^2 + 9 = 0$
$-9 \quad -9$

$x^2 = -9$
sqare root of both sides
$x = \pm\sqrt{-9}$
$x = \pm\sqrt{9 \cdot -1} = \pm\sqrt{9}\sqrt{-1}$
$x = \pm 3i$

Solve $x^2 - 6x + 25 = 0$

use the quadratic formula

a) $3(x-1)^2 = -27$ **b)** $(x+5)^2 + 10 = 2$ **c)** $5(2x+8)^2 = -80$