Group Warm Up-NO CALC

1. The multiplicative inverse of a complex number is $\frac{1}{z}$ where $z \neq 0$. Find the multiplicative inverse,or reciprocal, of the complex number. Then use complex conjugates to simplify the multiplicative inverse.

$$2+5i$$

2. Two complex numbers a+bi and c+di are equal when a=c and b=d. Solve this equation for x and y.

$$2x+3yi=-14+9i$$

3. Solve by factoring.

$$6x^2=19x+7$$

4. Solve by completing the square.

$$2x^2+4=10x$$

5. Solve by quadratic formula.

$$-2(x+1)^2=3$$

Teacher note: answers on next slide

Answers to week 12 Block Day Warm-up

1. $\frac{1}{2+5i}$

$\left(\frac{1}{2+5i}\right)\left(\frac{2-5i}{2-5i}\right)$

$=\frac{2-5i}{29}=\frac{2}{29}-\frac{5}{29}i$

	2	-5i
2	4	-10i
+5i	+10i	$-25i^2$

$4-25i^2=4-25(-1)$

$=4+25=29$

2. $2x+3yi=-14+9i$

$2x=-14 \quad 3y=9$

$x=-7 \quad y=3$

3. $6x^2=19x+7$

$6x^2-19x-7=0$

$(2x-7)(3x+1)=0$

$2x-7=0$ or $3x+1=0$

$x=\frac{7}{2}$ or $x=-\frac{1}{3}$

4. $2x^2+4=10x$

$\frac{2x^2}{2}+\frac{4}{2}=\frac{10x}{2}$

$x^2+2=5x$

$x^2-5x=-2$

$x^2-5x+\frac{25}{4}=-2+\frac{25}{4}$

$\left(x-\frac{5}{2}\right)^2=\frac{17}{4}$

$x-\frac{5}{2}=\pm\frac{\sqrt{17}}{2}$

$x=\frac{5\pm\sqrt{17}}{2}$

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

$-2(x^2+2x+1)-3=0$

$-2x^2-4x-2-3=0$

$-2x^2-4x-5=0$

$2x^2+4x+5=0$

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$=\frac{-(4)\pm\sqrt{(4)^2-4(2)(5)}}{2(2)}$

$\frac{-4\pm\sqrt{16-40}}{4}=\frac{-4\pm\sqrt{-24}}{4}$

$=\frac{-4\pm2i\sqrt{6}}{4}=\frac{-2\pm i\sqrt{6}}{2}$

New Lesson: Solving Systems of Quadratics Using Substitution

Solve using algebra:

Ex.1 $y = x^2$

$y = x + 2$

Solve by substitution

$x^2 = x + 2$

$x^2 - x - 2 = 0$

$(x-2)(x+1) = 0$

$x - 2 = 0$ or $x + 1 = 0$

$x = 2$ or $x = -1$

we need Points of intersection.

$y = x^2$ $\quad x = 2$

$y = 2^2 = 4$

$(2, 4)$

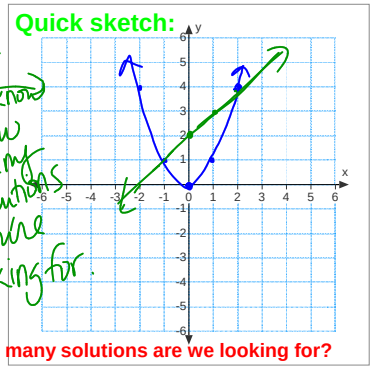
$y = x^2$ $\quad x = -1$

$y = (-1)^2 = 1$

$(-1, 1)$

sketch so you know how many solutions you're looking for.

Quick sketch:



How many solutions are we looking for? 2

Solve using algebra:

Ex.2 $y = -x^2 + 3$

$y = x^2$

Use subst

$x^2 = -x^2 + 3$

$+x^2 \quad +x^2$

$\frac{2x^2}{2} = \frac{3}{2}$

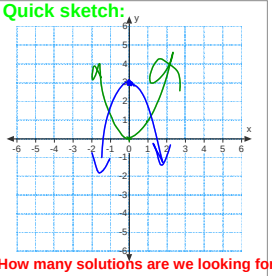
$x^2 = \frac{3}{2}$

$x = \pm\sqrt{\frac{3}{2}} = \pm\frac{\sqrt{3}\sqrt{2}}{\sqrt{2}\sqrt{2}}$

$x = \pm\frac{\sqrt{6}}{2}$

reflection across x-axis up 3

Quick sketch:



How many solutions are we looking for? 2

subst into $y = x^2$

$y = \left(\sqrt{\frac{3}{2}}\right)^2 = \frac{3}{2}$

$y = \left(-\sqrt{\frac{3}{2}}\right)^2 = \frac{3}{2}$

$\left(\frac{\sqrt{6}}{2}, \frac{3}{2}\right), \left(\frac{-\sqrt{6}}{2}, \frac{3}{2}\right)$