

$$(3+3i+8)-2i-7$$

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

$$\sqrt{-1} \cdot \sqrt{-1}$$

$$4+i$$

$$(4-5i)(4+i)$$

$$16 + 4i - 20i - 5i^2$$

$$21 - 16i$$

$$i^{24} = 1$$

$$4 \overline{) 24} \begin{array}{r} 6 \\ \underline{24} \\ 0 \end{array} \text{ no rem.}$$

$i = \sqrt{-1}$	Rem. 1	$i^{25} = 4 \overline{) 25} \begin{array}{r} 6 \\ \underline{24} \\ 1 \end{array} \frac{1}{4} \rightarrow 25$
$i^2 = \sqrt{-1} \cdot \sqrt{-1} = -1$	Rem. 2	$\frac{2}{4} \rightarrow 50$
$i^3 = i^2 \cdot i = -i$	Rem. 3	$\frac{3}{4} \rightarrow 75$
$i^4 = i^2 \cdot i^2 = 1$	No Remainder	$\frac{4}{4}$

$$i^5 = i^4 \cdot i = i$$

$$i^6 = i^4 \cdot i^2 = -1$$

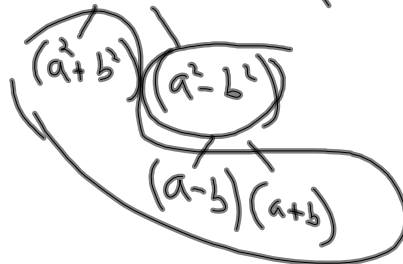
$$i^7 = i^5 \cdot i^2 = -i$$

$$i^8 = i^4 \cdot i^4 = 1$$

$$i^{4376521} = i$$

Review - Factoring QUADRATIC EXPRESSIONS

$$1) a^4 - b^4 \Rightarrow (a^2 + b^2)(a + b)(a - b)$$



$$x^2 - x - 6$$

-6		-1
-6	2, -3	-1

$$(x+2)(x-3)$$

$$x^2 + x - 6$$

$$(x^2 + 2x)(3x - 6)$$

$$x(x+2) - 3(x+2)$$

$$(x-3)(x+2)$$

$$2x^2 - 7x + 6$$

12		-7
12	-4, -3	-7

$$(2x^2 - 4x)(-3x + 6)$$

$$2x(x-2) - 3(x-2)$$

$$(2x-3)(x-2)$$

$$a^2 x^4 - 81 a^2$$

$$a^2 (x^4 - 81)$$

$$a^2 (x^2 - 9)(x^2 + 9)$$

$$a^2 (x+3)(x-3)(x^2 + 9)$$

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

$2x^3 + 2x^2 + 22x$

$(2x)(x^2 + x + 11)$ $\frac{11}{1} \frac{1}{1}$

Quadratic Formula $ax^2 + bx + c$

$a=1 \quad b=1 \quad c=11$



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

$$\frac{-(1) \pm \sqrt{(1)^2 - 4(1)(11)}}{2(1)} = \frac{-1 \pm \sqrt{43}}{2}$$

$$\frac{-1 \pm \sqrt{43}}{2} \quad i\sqrt{43}$$

$$\frac{-1 \pm 6.56i}{2} = \begin{cases} -\frac{1}{2} + 3.28i \\ -\frac{1}{2} - 3.28i \end{cases}$$

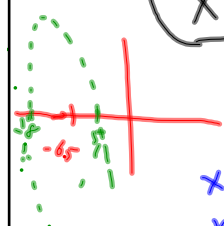
$x = -\frac{1}{2} + 3.28i$
 $x = -\frac{1}{2} - 3.28i$

$x^2 - 13x + 40$ $\begin{array}{r|l} 40 & -13 \\ 40 & -8-5 \end{array}$

$(x-5)(x-8)$

$x-5=0 \quad x=5$
 $x-8=0 \quad x=8$



$$\sqrt{\frac{-2}{7}} = \frac{\sqrt{-2}}{\sqrt{7}} = \frac{i\sqrt{2}}{\sqrt{7}} \quad \sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

$$\frac{i\sqrt{2}}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{i\sqrt{14}}{7}$$

$$(8 - \sqrt{-11})(8 + \sqrt{-11})$$

$$64 + 8\sqrt{-11} - 8\sqrt{11} - (-11)$$

$$\begin{array}{l} 75 \\ (8 - i\sqrt{11})(8 + i\sqrt{11}) \end{array} \begin{array}{l} -i\sqrt{11} \cdot i\sqrt{11} \\ -i^2 \cdot 11 \\ -11i^2 \\ +11 \end{array}$$

$$64 + 8i\sqrt{11} - 8i\sqrt{11}$$

$$64 + 11$$

$$75$$

Factoring Quadratic Expressions Review



$$4a^2 - 9b^2$$



$$(2a+3b)(2a-3b)$$

$$a^4 - b^4$$

$$= (a^2 + b^2)(a^2 - b^2)$$

$$(a^2 + b^2)(a-b)(a+b)$$

$$x^2 - 10x + 21$$

$$(x-3)(x-7)$$

21	-10
21	-7, -3
	-16

$$(x^2 - 7x)(3x + 21)$$

$$x(x-7) - 3(x-7)$$

$$(x-3)(x-7)$$

$$12x^2 - 4x - 5$$

-60	-4
-60	-10, 6
	-4

$$(12x^2 + 6x)(-10x - 5)$$

$$6x(2x+1) - 5(2x+1)$$

$$(6x-5)(2x+1)$$

Quadratic Formula.

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

$$ax^2 + bx + c = 0$$

$$2x^2 + 2x + 11$$

$$2(0x^2 + 1x + 11)$$

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

$$a=2$$

$$b=1$$

$$c=11$$

$a=1$
 $b=1$
 $c=11$

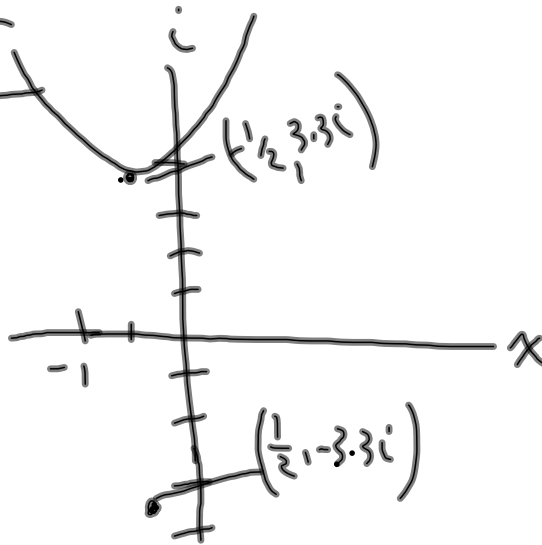
$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{(-1) \pm \sqrt{(1)^2 - 4(1)(11)}}{2(1)}$$

$$X = \frac{-1 \pm \sqrt{-43}}{2}$$

$$X = -\frac{1}{2} + \frac{i\sqrt{43}}{2} \quad \begin{matrix} \rightarrow -\frac{1}{2} + 3.3i \\ -\frac{1}{2} - 3.3i \end{matrix}$$

$$X = -\frac{1}{2} - \frac{i\sqrt{43}}{2}$$



$(x-3)(x+1)$ ← **factor**

$x-3=0$ $x+1=0$

$x=3$ $x=-1$ ← **Root**

$$2x^2 - 5x - 2$$