Quadratic Functions & Complex Numbers

Imaginary Numbers

$\sqrt{-1} = i$

$\sqrt{-16} = 4i$

$\sqrt{-24} = 2i\sqrt{6}$ (4·6)

Simplify.

$\frac{12+\sqrt{-20}}{2} = \frac{12+2i\sqrt{5}}{2} = 6+i\sqrt{5}$

$\frac{15+7i\sqrt{3}}{5} = \frac{15}{5} + \frac{7i\sqrt{3}}{5} = 3+\frac{7i\sqrt{3}}{5}$

~~$\frac{12+2i\sqrt{5}}{2}$~~

Complex Numbers – Real & Imag. Part

$7+4i$

$8+0i$

$0-3i$

$0.25\ i = i$

$0.5\ i^2 = -1$

$0.75\ i^3 = -i$

$0.00\ i^4 = 1$

$i^{23} = i^3 = -i$

$23 \div 4 = 5.75$

$= 5\ 3/4$

$2i^{80}_{.00} - 3i^{55}_{.25} + 4i^{74}_{0.5}$

$2(i^4) - 3(i) + 4(i^2)$

$2(1) - 3i + -4$

$= \boxed{-2-3i}$

$(8+4i)+(7-5i)=15-i$

$(7-2i\sqrt{3})+(+5+3i\sqrt{3})=12-5i\sqrt{3}$

$(8+2i)(5-3i)$

FOIL!

$=40-24i+10i+6i^2$

$=\boxed{46-14i}$

$(4-5i)^2=(4-5i)(4-5i)$

$=16-20i-20i+25i^2$

$=\boxed{-9-40i}$

Find the conjugate & then multiply.

$(2-3i)\cdot(2+3i)$

$=4+6i-6i-9i^2$

$=4+9$

$=\boxed{13}$

Firsts & Lasts

$$\frac{8+5i}{3i} \cdot \frac{i}{i}$$

$$= \frac{8i+5i^2}{-3i^2}$$

$$= \frac{-8i+5}{+3}$$

$$= \boxed{\frac{5-8i}{3}}$$

$$\frac{3+4i}{5-2i}\,\frac{(5+2i)}{(5+2i)}$$

$$= \frac{15+6i+20i+8i^2}{25+4i^2}$$

$$\boxed{\frac{7+26i}{29}}$$