2.3 Complex numbers.

Imaginary. form $a+bi$

where $i=\sqrt{-1}$ or $i^2=-1$

$a+bi$

Real part

$$\sqrt{-4}=\sqrt{-1}\sqrt{4}=i2=\boxed{2i}$$

Simplify: $(3+i)+(2-3i)$.

$$3+i+2-3i$$

$$\boxed{5-2i}$$

$$\sqrt{-4}+(-4-\sqrt{-4}).$$

$$\cancel{\sqrt{-4}}-4-\cancel{\sqrt{-4}}=\boxed{-4}$$

$$(3+2i)+(4-i)-(7+i)=\boxed{0}$$

$$\sqrt{-4}\sqrt{-16}=2i\,4i=8i^2=\boxed{-8}$$

$$(2-i)(4+3i)=8+6i-4i-3i^2=11+2i$$

$$(3+2i)^2=9+12i+(2i)^2=\boxed{5+12i}$$

$\sqrt{a}\sqrt{b}=\sqrt{ab}$ true only if $a,b>0$

Simplify $\frac{2+3i}{4-2i}$ form $a+bi$

Hint: $(a+bi)(a-bi) = a^2+b^2$

conjugate.

Rationalize. $\frac{2+3i}{4-2i} \cdot \frac{4+2i}{4+2i} = \frac{\quad}{4^2+2^2}$

$$\frac{8+4i+12i-6}{20} = \frac{2+16i}{20}$$

$$= \boxed{\frac{1}{10} + \frac{4}{5}i}$$

Write $-6i^3+i^2$ in the form $a+bi$

$$i^2\left[-6i+1\right]$$

$$-(-6i+1) = \boxed{-1+6i}$$

$$i^{137} = i^{136}i = (i^2)^{68}i$$

$$= (-1)^{68}i = \boxed{i}$$

$$\frac{1}{(2i)^3} = \frac{1}{-8i} \cdot \frac{i}{i} = \frac{i}{8}$$

$$\boxed{\frac{1}{8}i}$$

Quiz upto 2.2, 2.3 | Quadratic inequalities