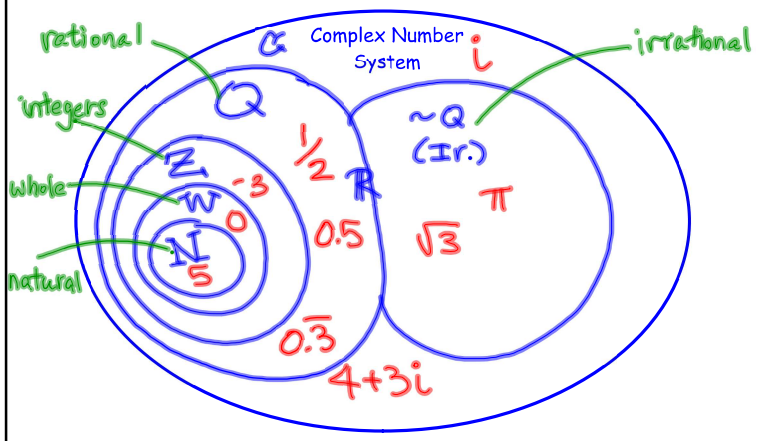
Complex Numbers

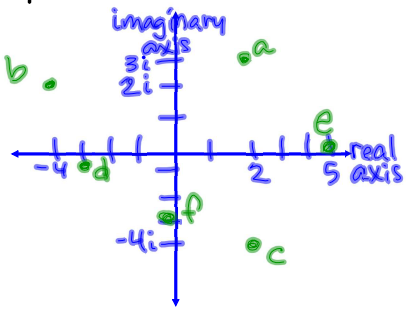
$i = \sqrt{-1}$



complex number: (standard form) $a + bi$ (a: real #, b: imaginary #)

Ex.1 Plot each complex number.

a. 2 + 3i
b. -4 + 2i
c. 2 - 4i
d. -3 - i
e. 5
f. -3i



$\sqrt{-1} = i$

$i^2 = -1$

$i^3 = -i$

$i^4 = 1$

} memorize!

Ex.2 Simplify

a. $i^7 = -i$ ($4\overline{)7}$ R 3 $\leftarrow i^3$)

b. $i^{15} = -i$ ($4\overline{)15}$ R 3 $\leftarrow i^3$)

c. $i^{54} = -1$ ($4\overline{)54}$ R 2 $\leftarrow i^2$)

Ex.3 Simplify

a. $\sqrt{-4} = 2i$

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

c. $3\sqrt{-16} = 3 \cdot 4i = 12i$

d. $\sqrt{-\frac{4}{9}} = \frac{2}{3}i$

e. $\sqrt{-18} = \sqrt{-9} \cdot \sqrt{2} = 3i\sqrt{2}$

f. $\sqrt{64} + \sqrt{-63} = 8 + \sqrt{-9} \cdot \sqrt{7} = 8 + 3i\sqrt{7}$

g. $-\sqrt{25} + 7 = -5 + 7 = 2$