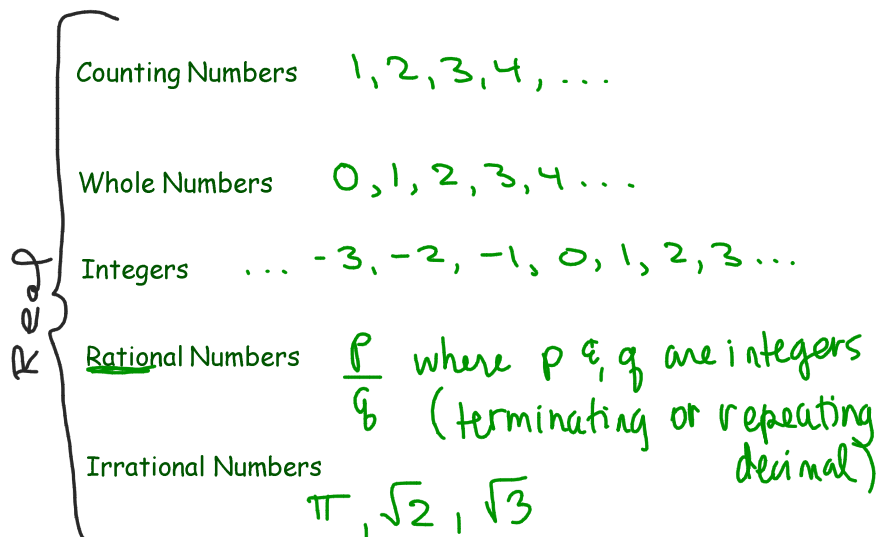


## Complex Numbers

53



$$\sqrt{-1} = i \quad (i) \quad \text{~~i~~} \quad i^2 = -1$$

$$\sqrt{-7} = \sqrt{-1} \cdot \sqrt{7} = i\sqrt{7}$$

$$\sqrt{-12} = \sqrt{-1} \cdot \sqrt{12} = i\sqrt{4} \cdot \sqrt{3} = 2i\sqrt{3}$$

Solve:  $2x^2 + 18 = -72$

$$\begin{aligned} & -18 \quad -18 \\ 2x^2 &= -90 \\ x^2 &= -45 \\ \sqrt{x^2} &= \sqrt{-45} \end{aligned}$$

↗

$$\begin{aligned} x &= \pm\sqrt{-45} \\ x &= \pm\sqrt{-1} \cdot \sqrt{45} \\ x &= \pm i\sqrt{9} \cdot \sqrt{5} \\ x &= \pm 3i\sqrt{5} \end{aligned}$$

Solve:  $\frac{-4(n-2)^2}{-4} = \frac{20}{-4}$

$$\sqrt{(n-2)^2} = \sqrt{-5}$$

$$n-2 = \pm\sqrt{-5}$$

$$n-2 = \pm i\sqrt{5}$$

$$n = 2 \pm i\sqrt{5}$$

$$1) (-8 + 8i) - 1(2 + 4i)$$

$$-8 + 8i - 2 - 4i$$

$$-10 + 4i$$

$$11) (-1 + 3i)(1 + 6i)$$

$$-1 - 6i + 3i + 18i^2$$

$$-1 - 3i + 18(-1)$$

$$-1 - 3i - 18$$

$$-19 - 3i$$

$$31) \frac{8}{7+8i} \cdot \frac{7-8i}{7-8i} = \frac{8(7-8i)}{(7+8i)(7-8i)}$$

$$\frac{56 - 64i}{49 - 64i^2} = \frac{56 - 64i}{49 - 64(-1)}$$

$$= \frac{56 - 64i}{49 + 64} = \frac{56 - 64i}{113}$$

$$= \frac{56}{113} - \frac{64i}{113}$$