

ADD & SUBT

Examples:

1) $(7 - 8i) + (-2 + 11i)$

Treat "i" like any other variable.

$$= 5 + 3i$$

2) $(6 - i) - (8 - 10i)$

Distribute the neg. sign
 $6 - i - 8 + 10i$

$$= -2 + 9i$$

3) $(2 + 3i\sqrt{2}) - (6 - i\sqrt{2})$

When *adding* square roots, do not change to square root part.

$$\begin{aligned} 2 + 3i\sqrt{2} - 6 + i\sqrt{2} \\ = -4 + 4i\sqrt{2} \end{aligned}$$

Distribute

Examples: 4) $8(7 - 4i)$

Distribute, literally.

$$= 56 - 32i$$

5) $-3(2i - 5) - (1 + 4i)$

$$-6i + 15 - 1 - 4i$$

$$= 14 - 10i$$

FOIL

Examples:

6) $(5 + 2i)(4 + 7i)$

$$\begin{aligned} 20 + 35i + 8i + 14i^2 \\ 20 + 43i + 14(-1) \\ 20 + 43i - 14 \\ 6 + 43i \end{aligned}$$

Reminder
 $i^2 = -1$

7) $(1 - i)(11 + i)$

$$\begin{aligned} 11 + i - 11i - i^2 \\ 11 - 10i - (-1) \\ 11 - 10i + 1 \\ 12 - 10i \end{aligned}$$

8) $(3 - 8i)^2$

$$\begin{aligned} (3 - 8i)(3 - 8i) \\ 9 - 24i - 24i + 64i^2 \\ 9 - 48i - 64 \\ -55 - 48i \end{aligned}$$

short cut: The i^2 just changes the sign of the # that precedes it.

Solving Equations

Examples:

9) $x^2 + 63 = 0$

$$\begin{aligned} x^2 &= -63 \\ x &= \pm\sqrt{-63} \\ x &= \pm i\sqrt{9\sqrt{7}} \\ x &= \pm 3i\sqrt{7} \end{aligned}$$

10) $2n^2 + 18 = 0$

$$\begin{aligned} 2n^2 &= -18 \\ n^2 &= -9 \\ n &= \pm\sqrt{-9} \\ n &= \pm 3i \end{aligned}$$

11) $-3n^2 - 75 = 0$

$$\begin{aligned} -3n^2 &= 75 \\ n^2 &= -25 \\ n &= \pm\sqrt{-25} \\ n &= \pm 5i \end{aligned}$$