

$$\begin{aligned}
x^2 + (2 + 2i)x - (12 - 18i) &= 0 \\
D &= (2 + 2i)^2 - 4(-(12 - 18i)) \\
D &= 4 + 8i + 4i^2 + 4(12 - 18i) \\
D &= 4 + 8i - 4 + 48 - 72i \\
D &= 48 - 64i \\
z &\in \mathbb{C} : z = a + bi \\
z &= \sqrt{D} \mid \uparrow^2 \\
z^2 &= D = 48 - 64i \\
a^2 - b^2 + 2abi &= 48 - 64i
\end{aligned}$$

$$\begin{aligned}
a^2 - b^2 &= 48 \\
2abi &= -64i
\end{aligned}$$

$$\begin{aligned}
a^2 - b^2 &= 48 \\
a &= \frac{-32}{b}
\end{aligned}$$

$$\begin{aligned}
a^2 - b^2 &= 48 \\
\left(\frac{-32}{b}\right)^2 - b^2 &= 48 \\
b^2 - \left(\frac{-32}{b}\right)^2 + 48 &= 0 \mid b^2 \\
b^4 + 48b^2 - 32^2 &= 0 \\
y = b^2, y \geq 0 \\
y^2 + 48y - 32^2 &= 0 \\
D_y &= 48^2 - 4(-32^2) \\
D_y &= 48^2 + 4 \times 32^2 \\
D_y &= 2^2 \times 3^2 \times 8^2 + 2^2 \times 4^2 \times 8^2 \\
D_y &= 2^2 8^2 (3^2 + 4^2) = 2^2 8^2 5^2 \\
\sqrt{D_y} &= 2 \times 5 \times 8 = 80 \\
y_1 &= \frac{-48+80}{2} = -24 + 40 = 16 > 0 \\
y_2 &= \frac{-48-80}{2} = -24 - 40 = -64 \leq 0
\end{aligned}$$

$$\begin{aligned}
b^2 &= 16, b = \pm 4 \\
a &= \frac{-32}{\pm 4}, a = \mp 8 \\
z &= \mp 8 \pm 4i \\
x_1 &= \frac{-(2+2i)+(-8+4i)}{2} = \frac{-2-2i-8+4i}{2} = -1 - i - 4 + 2i = -5 + i \\
x_2 &= \frac{-(2+2i)-(-8+4i)}{2} = \frac{-2-2i+8-4i}{2} = -1 - i + 4 - 2i = 3 - 3i \\
x_3 &= \frac{-(2+2i)+(8-4i)}{2} = \frac{-2-2i+8-4i}{2} = -1 - i + 4 - 2i = 3 - 3i \\
x_4 &= \frac{-(2+2i)-(8-4i)}{2} = \frac{-2-2i-8+4i}{2} = -1 - i - 4 + 2i = -5 + i \\
x_1 = x_4, x_2 &= x_3
\end{aligned}$$