12pm

Solution of Problem 1

$$\begin{aligned} z &= (3-2i)^2 \\ &= 9-12i+4i^2 \\ &= 9-12i-4 \\ &= 5-12i \end{aligned}$$

Plot the point $(5,-12)$

Solution of Problem 2

$$\overline{2-3i} = 2+3i$$

Solution of Problem 3

$$\begin{aligned} \frac{2+i}{2+2i} &= \frac{(2+i)(2-2i)}{(2+2i)(2-2i)} \\ &= \frac{4+2i-4i-2i^2}{2^2+2^2} \\ &= \frac{4-2i-2i^2}{8} \\ &= \frac{6-2i}{8} \end{aligned}$$

So, $a=\frac{3}{4}$, $b=-\frac{1}{4}$

Solution of Problem 4

$$\begin{aligned} (2+i)(2+2i) &= 4+2i+4i+2i^2 \\ &= 4+6i+2i^2 \\ &= 2+6i \end{aligned}$$

So, $a=2$, $b=6$

1pm

Solution of Problem 1

$$\begin{aligned}\frac{1}{3-2i} &= \frac{1\cdot(3+2i)}{(3-2i)\cdot(3+2i)}\\ &= \frac{3+2i}{3^2+4^2}\\ &= \frac{3+2i}{13}\\ &= \frac{3}{13}+\frac{2}{13}i\end{aligned}$$

Plot the point $(\frac{3}{13}, \frac{2}{13})$

Solution of Problem 2

$$\overline{3+2i} = 3-2i$$

Solution of Problem 3

$$\begin{aligned}\frac{3+i}{3+2i} &= \frac{(3+i)(3-2i)}{(3+2i)(3-2i)}\\ &= \frac{9+3i-6i-2i^2}{3^2+2^2}\\ &= \frac{9-3i-2i^2}{13}\\ &= \frac{11-3i}{13}\end{aligned}$$

So, $a = \frac{11}{13}$,$b = -\frac{-3}{13}$

Solution of Problem 4

$$\begin{aligned}(3+2i)(3+i) &= 9+6i+3i+2i^2\\ &= 9+9i+2i^2\\ &= 7+9i\end{aligned}$$

So, $a = 7$, $b = 9$

2pm

Solution of Problem 1

$$\overline{3-2i} \;=\; 3+2i$$

Plot the point $(3, 2)$

Solution of Problem 2

$$|i+3| \;=\; \sqrt{3^2+1^2} = \sqrt{10}$$

Solution of Problem 3

$$\begin{aligned}\frac{1+2i}{2+2i} &= \frac{(1+2i)(2-2i)}{(2+2i)(2-2i)}\\ &= \frac{2+4i-2i-4i^2}{2^2+2^2}\\ &= \frac{2+2i-4i^2}{8}\\ &= \frac{6+2i}{8}\end{aligned}$$

So, $a = \frac{3}{4}$, $b = \frac{1}{4}$

Solution of Problem 4

$$\begin{aligned}(1+2i)(2+2i) &= 2+4i+2i+4i^2\\ &= 2+6i+4i^2\\ &= -2+6i\end{aligned}$$

So, $a = -2$, $b = 6$

3pm

Solution of Problem 1

$$\overline{1+i} \;=\; 1-i$$

Plot the point $(1,-1)$

Solution of Problem 2

$$\begin{aligned} |2-3i| &= \sqrt{2^2+(-3)^2} \\ &= \sqrt{4+9} \\ &= \sqrt{13} \end{aligned}$$

Solution of Problem 3

$$\begin{aligned} \frac{2+i}{1-2i} &= \frac{(2+i)(1+2i)}{(1-2i)(1+2i)} \\ &= \frac{2+i+4i+2i^2}{1^2+2^2} \\ &= \frac{2+5i+2i^2}{5} \\ &= \frac{5i}{5} \\ &= i \end{aligned}$$

So, $a=0$, $b=1$

Solution of Problem 4

$$\begin{aligned} (2+i)(1-2i) &= 2+i-4i-2i^2 \\ &= 2-3i-2i^2 \\ &= 4-3i \end{aligned}$$

So, $a=4$, $b=-3$