

Exercise 56

For the following exercises, evaluate the expressions, writing the result as a simplified complex number.

$$\frac{3 + 2i}{2 + i} + (4 + 3i)$$

Solution

Simplify the given expression.

$$\begin{aligned}\frac{3 + 2i}{2 + i} + (4 + 3i) &= \frac{2 - i}{2 - i} \times \frac{3 + 2i}{2 + i} + (4 + 3i) \\ &= \frac{(2 - i)(3 + 2i)}{(2 - i)(2 + i)} + (4 + 3i) \\ &= \frac{6 + 4i - 3i - 2i^2}{4 + 2i - 2i - i^2} + (4 + 3i) \\ &= \frac{6 + i + 2}{4 + 1} + (4 + 3i) \\ &= \frac{8 + i}{5} + (4 + 3i) \\ &= \frac{8}{5} + \frac{1}{5}i + 4 + 3i \\ &= \frac{28}{5} + \frac{16}{5}i\end{aligned}$$