

## Solutions to Problems

### Problem 4.1

$$(2 + 3j)(1 - 2j) = 2 - 4j + 3j + 6 = 8 - j.$$

Equation 4.3 gives the modulus of the complex number  $(8-j)$  to be  $\sqrt{8^2 + 1^2} = \sqrt{65}$ .

### Problem 4.2

$$\begin{aligned} \frac{(3 + 4j)(1 - 2j)}{(2 - 3j)(2 + j)} &= \frac{(11 - 2j)}{(7 - 4j)} = \frac{(11 - 2j)(7 + 4j)}{(7 - 4j)(7 + 4j)} \\ &= \frac{77 - 14j + 8 + 44j}{(7^2 + 4^2)} = \frac{85 + 30j}{65} = \frac{1}{13}(17 + 6j). \end{aligned}$$