
Exponential and Basic Algebra

Exercise 1.3 - Question 6

6j)

Expand the following: $(5e - 2i)(25e^2 + 10ei + 4i^2)$

Solution

Multiplying $5e$ and $-2i$ by the second bracket

$$= 5e(25e^2 + 10ei + 4i^2) - 2i(25e^2 + 10ei + 4i^2)$$

Multiply $5e$ and $-2i$ by every term inside the bracket

$$= 125e^3 + 50e^2i + 20ei^2 - 50e^2i - 20ei^2 - 8i^3$$

Simplifying by collecting like terms

$$= 125e^3 + 50e^2i + 20ei^2 - 50e^2i - 20ei^2 - 8i^3$$

$$= 125e^3 - 8i^3$$

Answer: $(5e - 2i)(25e^2 + 10ei + 4i^2) = 125e^3 - 8i^3$

Exercise 1.8 - Question 3

3c)

Simplify the following:

$$\frac{3}{2f - g} + \frac{5}{3f + g}$$

Solution

$$\frac{3(3f + g)}{(2f - g)(3f + g)} + \frac{5(2f - g)}{(2f - g)(3f + g)}$$

Writing the fractions using the LCD as the common denominator

$$= \frac{3(3f + g) + 5(2f - g)}{(2f - g)(3f + g)}$$

Writing as a single fraction

$$= \frac{9f + 3g + 10f - 5g}{(2f - g)(3f + g)}$$

Expanding the brackets

$$= \frac{19f - 2g}{(2f - g)(3f + g)}$$

Collecting like terms

Answer:
$$\frac{19f - 2g}{(2f - g)(3f + g)}$$
