

Exercise 35

For the following exercises, perform the indicated operation and express the result as a simplified complex number.

$$\frac{3 + 4i}{2 - i}$$

Solution

Start by making the denominator real. Then use the distributive property.

$$\frac{3 + 4i}{2 - i}$$

$$\frac{3 + 4i}{2 - i} \times \frac{2 + i}{2 + i}$$

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

$$\frac{6 + 3i + 8i + 4i^2}{4 + 2i - 2i - i^2}$$

$$\frac{6 + 11i + 4(-1)}{4 - (-1)}$$

$$\frac{6 + 11i - 4}{5}$$

$$\frac{2 + 11i}{5}$$

$$\frac{1}{5}(2 + 11i)$$

$$\frac{2}{5} + \frac{11}{5}i$$