

Exercise 1.1A Fluency and skills

- 1** Solve these equations.
- a** $x^2 = -25$ **b** $x^2 = -121$
c $x^2 = -20$ **d** $x^2 + 8 = 0$
e $z^2 = -9$ **f** $z^2 + 12 = 0$
- 2** Simplify these expressions, giving your answers in the form $a+bi$ where $a, b \in \mathbb{R}$
- a** $(2+3i)+(5-9i)$
b $(5-7i)-(12+3i)$
c $3(6-9i)$ **d** $3(2+10i)+5(4-i)$
e $4-9(7i+5)$ **f** $2(6-2i)-3(2i-5)$
- 3** Write each of these expressions in the form $a+bi$ where $a, b \in \mathbb{R}$
- a** $(2+3i)(i+5)$ **b** $(7-i)(6-3i)$
c $i(8-3i)$ **d** $(9-4i)^2$
- 4** Fully simplify each of these expressions.
- a** i^3 **b** i^4 **c** i^5
d $(2i)^3$ **e** $(3i)^4$ **f** $2i^2(5i-9)^2$
- 5** Simplify these fractions, giving your answers in the form $a+bi$ where $a, b \in \mathbb{R}$
- a** $\frac{3}{2+i}$ **b** $\frac{2i}{1-5i}$ **c** $\frac{1+7i}{3-i}$
d $\frac{i+3}{2i-1}$ **e** $\frac{6+3i}{i-\sqrt{2}}$ **f** $\frac{\sqrt{2}i-\sqrt{6}}{\sqrt{3}-i}$
- 6** You are given that $z_1 = 3i-2$, $z_2 = 4+i$
Calculate these expressions, fully simplifying your answers.
- a** z_1+z_2 **b** z_1z_2
c $\frac{z_1}{z_2}$ **d** $\frac{z_2}{z_1}$

Try Q7.

- 7.** Solve each of these quadratic equations.
- a** $x^2+5x+7=0$ **b** $x^2-3x+5=0$
c $2x^2+7x+7=0$ **d** $3x^2-10x+9=0$