

Subject Summer work 2026 - Further Maths

Do not use your calculator in this exercise.

1 Write each of the following in the form bi where b is a real number.

a $\sqrt{-9}$	b $\sqrt{-49}$	c $\sqrt{-121}$	d $\sqrt{-10\,000}$	e $\sqrt{-225}$
f $\sqrt{-5}$	g $\sqrt{-12}$	h $\sqrt{-45}$	i $\sqrt{-200}$	j $\sqrt{-147}$

2 Simplify, giving your answers in the form $a + bi$, where $a, b \in \mathbb{R}$.

a $(5 + 2i) + (8 + 9i)$	b $(4 + 10i) + (1 - 8i)$
c $(7 + 6i) + (-3 - 5i)$	d $(\frac{1}{2} + \frac{1}{3}i) + (\frac{5}{2} + \frac{5}{3}i)$
e $(20 + 12i) - (11 + 3i)$	f $(2 - i) - (-5 + 3i)$
g $(-4 - 6i) - (-8 - 8i)$	h $(3\sqrt{2} + i) - (\sqrt{2} - i)$
i $(-2 - 7i) + (1 + 3i) - (-12 + i)$	j $(18 + 5i) - (15 - 2i) - (3 + 7i)$

3 Simplify, giving your answers in the form $a + bi$, where $a, b \in \mathbb{R}$.

a $2(7 + 2i)$	b $3(8 - 4i)$
c $2(3 + i) + 3(2 + i)$	d $5(4 + 3i) - 4(-1 + 2i)$
e $\frac{6 - 4i}{2}$	f $\frac{15 + 25i}{5}$
g $\frac{9 + 11i}{3}$	h $\frac{-8 + 3i}{4} - \frac{7 - 2i}{2}$

(P) 4 Write in the form $a + bi$, where a and b are simplified surds.

a $\frac{4 - 2i}{\sqrt{2}}$	b $\frac{2 - 6i}{1 + \sqrt{3}}$
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5 Given that $z = 7 - 6i$ and $w = 7 + 6i$, find, in the form $a + bi$, where $a, b \in \mathbb{R}$:

a $z - w$	b $w + z$
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Notation Complex numbers are often represented by the letter z or the letter w .