

AQA Further Pure 1

Complex Numbers Activities

Activity 1

Give out the triangular cards and ask students to join them up to make a hexagon with them by matching equivalent expressions.

Activity 2

Ask students to investigate $(1+i)^n$ for $n = 1, 2, \dots$ and express their answers in the form $a+bi$. They should look for any patterns in a and b .

Activity 3

Find the errors on the sheet.

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Complex numbers Hexagonal Jigsaw

The three diagrams on the following pages will ultimately fit together to form a large hexagon. Before you start, the three diagrams must be cut along the lines to make twenty-four equilateral triangles. For the triangles to be fitted together, you must find two expressions that are equivalent to one another. To build up the puzzle, place the edges on which equivalent expressions are written together, so that the triangles are joined along this edge.

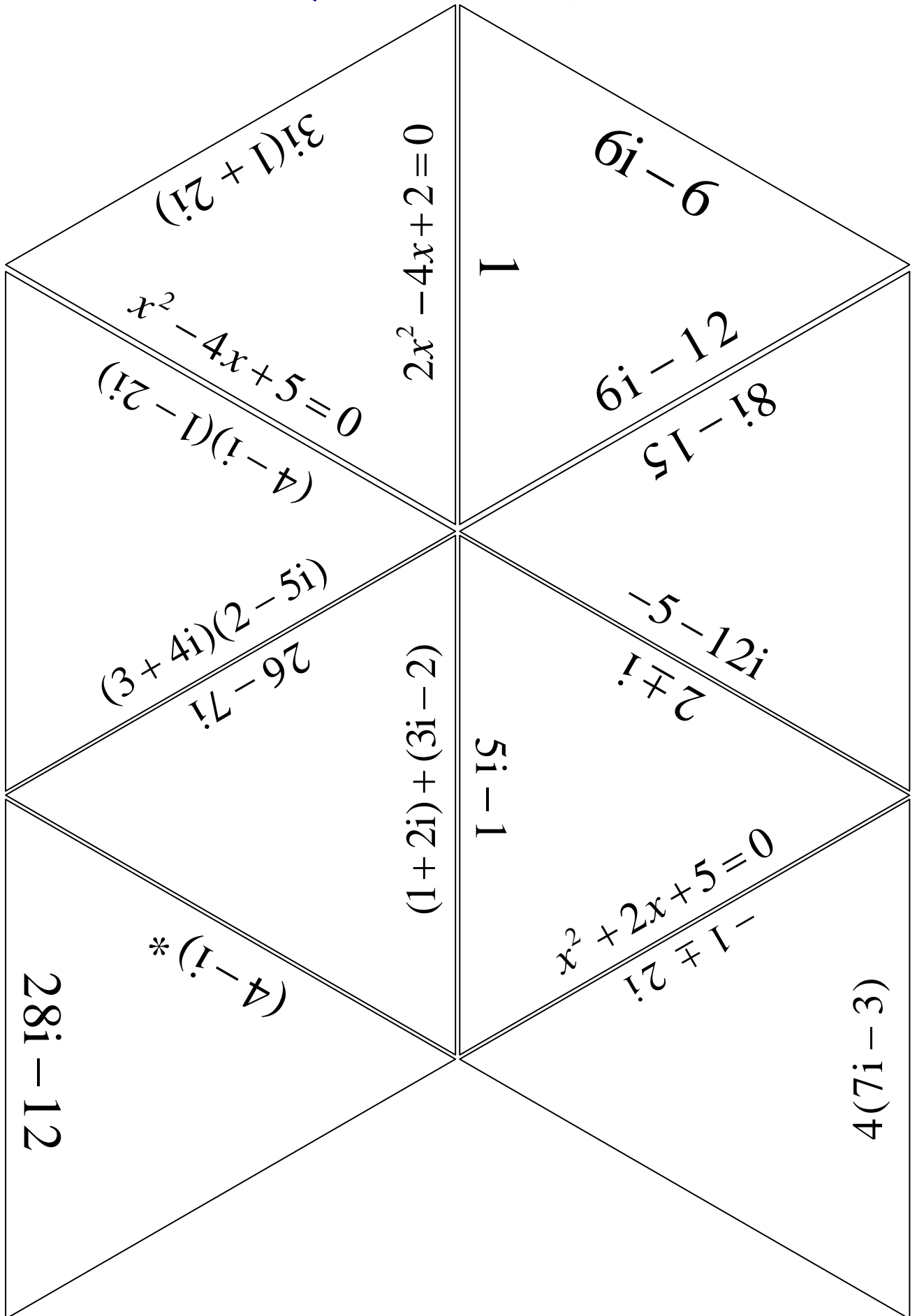
Begin by just finding pairs of matching expressions and placing them edge-to-edge.

As you progress you will find that all of the pieces will eventually link up to form a large hexagon.

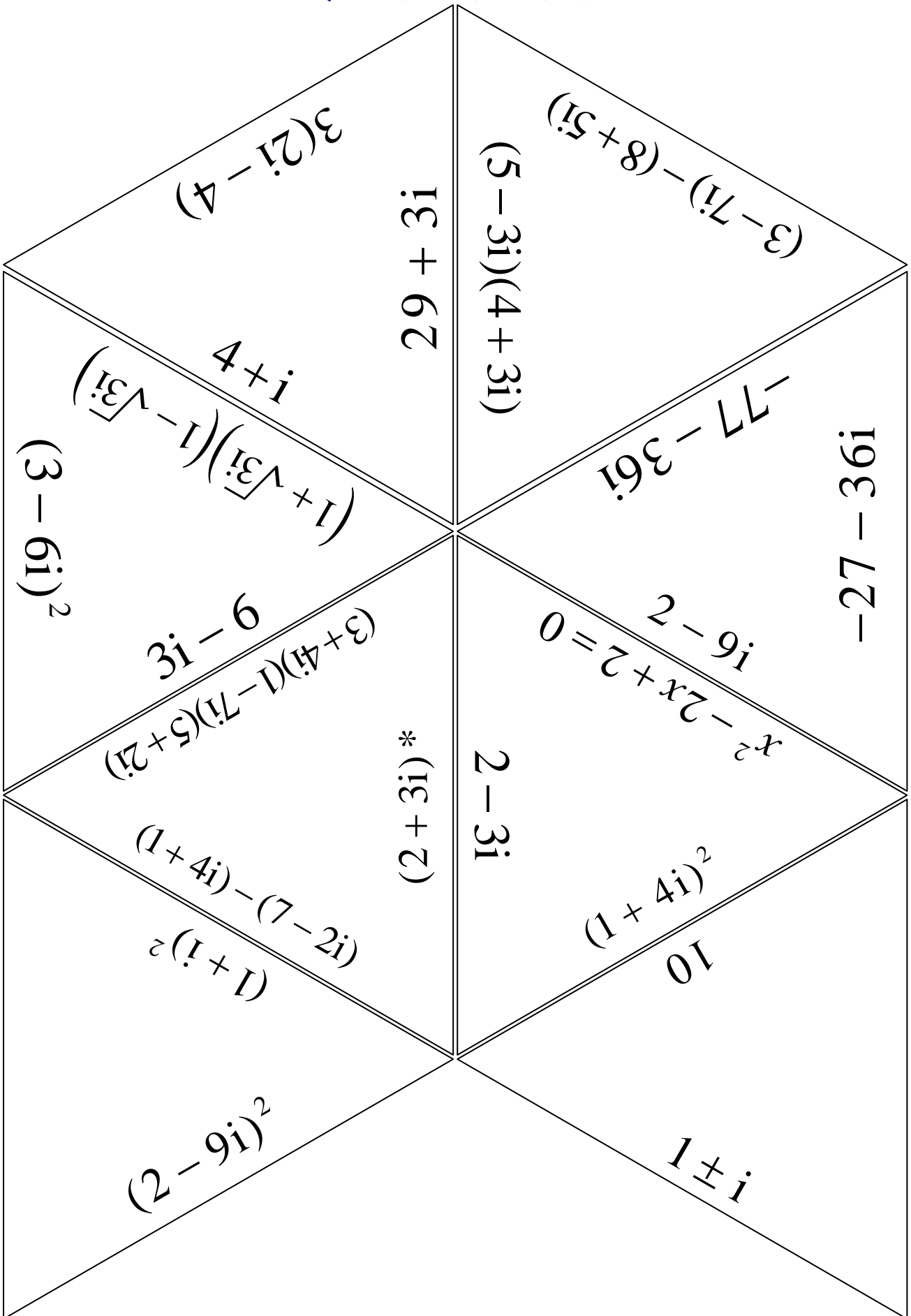
By all means try this by yourself, but it is really designed to be a group activity. Working with other students will help to highlight any misconceptions you may have, as well as making the task more enjoyable.

At first glance this may appear to be an easy undertaking, but you will find it takes quite a lot of thought and errors can be made very easily. Make sure you check each coupling, or you could be left with one or two pieces that appear to fit nowhere.

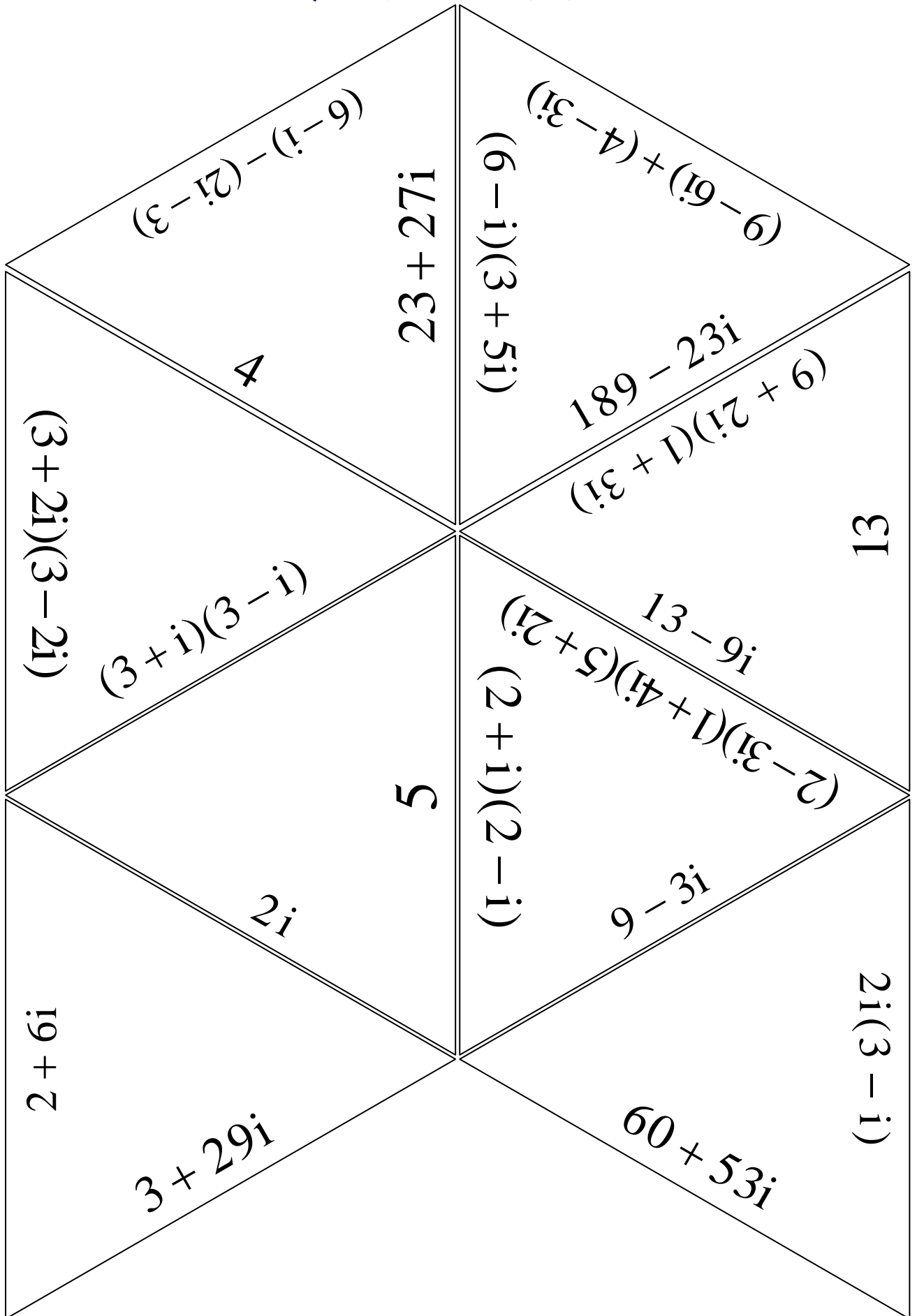
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Activity 3

Find the errors and correct them:

1. Solve $2z + i = 3 - z^*$

Solution:

Put $z = x + yi$

Then $2x + 2yi + i = 3 - x - yi$

So $2x = 3 - x$ and $2y = -y$

This gives $x = 1$ and $y = 0$

Therefore $z = 1$

2. Simplify $i(3 - 4i) + (2 - i)(4i + 2)$

Solution: $i(3 - 4i) + (2 - i)(4i + 2) = 3i - 4 + 8i - 4 + 4 - 2i$
 $= 9i - 4$