In a complex equation:
Re = Re and Im = Im

If $a + bi = x + yi$,
then $a = x$ and $b = y$

Example 2

Find x and y if $x + 2i + 2(3 - 5yi) = 8 - 13i$.
(LHS) (RHS)

Tidy LHS

$x + 2i + 2(3 - 5yi) = 8 - 13i$
$x + 2i + 6 - 10yi = 8 - 13i$

Re = Re: $x + 6 = 8 \Rightarrow x = 2$

Im = Im: $2i - 10yi = -13i$
$+10y = +15$
$y = 15/10$
$y = 3/2$

7. Find the values of a and b in each of the following:
(i) $a + bi + 3 - 2i = 4(-2 + 5i)$

$a + bi + 3 - 2i = 4(-2 + 5i)$

Expand RHS

$a + bi + 3 - 2i = -8 + 20i$

Re = Re: $a + 3 = -8 \Rightarrow a = -11$

Im = Im: $b - 2 = 20 \Rightarrow b = 22$

11. If $(x + iy)^2 = 8 - 6i$, find the values of x and y, $x, y \in R$.