One root of the equation $z^2 + bz + c = 0$ is $2 + 3i$ where $b, c \in \mathbb{Z}$.
Find the value of b and the value of c.

If $z = 2 + 3i$ is a root …then, the complex conjugate $z^* = 2 - 3i$ is also a root

Factors of the equation are $z - (2 + 3i)$

$z - (2 - 3i)$

The equation is $a\big(z - (2 + 3i)\big)\big(z - (2 - 3i)\big) = 0$

$a(z - 2 - 3i)(z - 2 + 3i) = 0$

$a(z^2 + (-2 + 3i)z + (-2 - 3i)z + (-2 - 3i)(-2 + 3i)) = 0$

Since $z^2 + bz + c = 0$, $a = 1$

$z^2 + (-2 + 3i)z + (-2 - 3i)z + (-2 - 3i)(-2 + 3i) = 0$

$z^2 - 4z + 4 - 9i^2 = 0$

$i^2 = -1$

$z^2 - 4z + 13 = 0$