

Further Pure Mathematics 1

Complex Numbers Unit 3

Hints

Exercise 2E

Question 1 Hint level 1

Compare each with $r(\cos \theta + j \sin \theta)$. Some need rewriting to put them in this form, with $r > 0$. Once in the correct form you can read off the value of r (the modulus) and the value of θ (the principal argument).

Question 2 Hint level 1

Remember that the modulus of a complex number $z = x + yj$ is $\sqrt{x^2 + y^2}$.

To find the argument, use $\theta = \arctan \frac{y}{x}$, but be careful – you need to make sure that the angle is in the right quadrant. Look at the original complex number and decide which quadrant it lies in, then add or subtract π if you need to.

Question 3 Hint level 1

Use $x = r \cos \theta$ and $y = r \sin \theta$ to find the real and imaginary parts, and hence write z in the form $x + yj$.

Question 4 Hint level 1

In each case, draw a diagram to show $5 + 2j$ and its argument α . Mark on the new number and look at how its argument is related to α .