MCINTYRE MATHS · MATHEMATICS EXTENSION 2

Practice worksheet

Lesson 5 · Modulus–argument form

Name: _____ Date: _____

Cartesian to polar

1. Write in modulus–argument form with the principal argument in exact form.

(a) $1 + i$ (b) $-\sqrt{3} + i$

(c) $-2 - 2i$ (d) $\sqrt{3} - 3i$

2. Write in modulus–argument form.

(a) -7 (b) $-3i$

(c) 12

3. Write $-5 + 12i$ in polar form with the argument correct to 2 decimal places.

Polar to Cartesian

4. Express in the form $x + iy$.

(a) $2 \text{ cis } \frac{\pi}{6}$ (b) $8 \text{ cis } \left(-\frac{\pi}{2}\right)$

(c) $\sqrt{8} \text{ cis } \frac{3\pi}{4}$ (d) $4 \text{ cis } \left(-\frac{2\pi}{3}\right)$

Conjugate and negative

5. Let $z = 3 \text{ cis } \frac{3\pi}{4}$. Write $\overline{z}$, $-z$ and $-\overline{z}$ in polar form.

6. Explain why $\text{Arg}(-5) = \pi$ and not $-\pi$. What is $\text{Arg}\left(\overline{-5}\right)$?

HSC-style

7. Let $z = 1 - i\sqrt{3}$. (i) Find $|z|$ and $\operatorname{Arg} z$. (ii) Write z in the form $r(\cos\theta + i\sin\theta)$. (iii) Write $-z$ in polar form with the principal argument.

