

Solutions

Each answer shows the steps, then the **result**.

2.1

- $|z| = \sqrt{3^2 + 4^2} = 5$

2.2

- $(2+i)(3-i) = 6 - 2i + 3i - i^2 = 7 + i$

3.1 B

- The point $(-1, 1)$ is in the second quadrant: $\arg z = \pi - \frac{\pi}{4} = \frac{3\pi}{4}$

3.2

(a)

- $z = \frac{10(2+i)}{(2-i)(2+i)} = \frac{20+10i}{5} = 4+2i$

(b)

- $|z| = \sqrt{4^2 + 2^2} = \sqrt{20} = 2\sqrt{5}$; $\arg z = \tan^{-1} \frac{2}{4} = 0.4636 \text{ rad}$

3.3

(a)

- a circle of radius 2 centred at the point $(2, 1)$

(b)

- the perpendicular bisector of the segment joining 3 and -1 — i.e. the vertical line $x = 1$