

Worked example

$$z_1 = 6\left(\cos\frac{5\pi}{12} + i\sin\frac{5\pi}{12}\right)$$

$$z_2 = 3\left(\cos\frac{3\pi}{4} + i\sin\frac{3\pi}{4}\right)$$

Find:

i) $|z_1 z_2|$

ii) $\arg(z_1 z_2)$

iii) $z_1 z_2$ in the form $r(\cos \theta + i \sin \theta)$

iv) $z_1 z_2$ in the form $x + iy$

Your turn

$$z_1 = 8\left(\cos\frac{7\pi}{10} + i\sin\frac{7\pi}{10}\right)$$

$$z_2 = 4\left(\cos\frac{4\pi}{5} + i\sin\frac{4\pi}{5}\right)$$

Find:

i) $|z_1 z_2|$ 32

ii) $\arg(z_1 z_2)$ $-\frac{\pi}{2}$

iii) $z_1 z_2$ in the form $r(\cos \theta + i \sin \theta)$

$$32\left(\cos\left(-\frac{\pi}{2}\right) + i\sin\left(-\frac{\pi}{2}\right)\right)$$

iv) $z_1 z_2$ in the form $x + iy$

$$-32i$$

Worked example

$$z_1 = 6\left(\cos\frac{5\pi}{12} + i\sin\frac{5\pi}{12}\right)$$

$$z_2 = 3\left(\cos\frac{3\pi}{4} + i\sin\frac{3\pi}{4}\right)$$

Find:

i) $\left|\frac{z_1}{z_2}\right|$

ii) $\arg\left(\frac{z_1}{z_2}\right)$

iii) $\frac{z_1}{z_2}$ in the form $r(\cos\theta + i\sin\theta)$

iv) $\frac{z_1}{z_2}$ in the form $x + iy$

Your turn

$$z_1 = 8\left(\cos\frac{7\pi}{10} + i\sin\frac{7\pi}{10}\right)$$

$$z_2 = 4\left(\cos\frac{4\pi}{5} + i\sin\frac{4\pi}{5}\right)$$

Find:

i) $\left|\frac{z_1}{z_2}\right|$

2

ii) $\arg\left(\frac{z_1}{z_2}\right)$

$-\frac{\pi}{10}$

iii) $\frac{z_1}{z_2}$ in the form $r(\cos\theta + i\sin\theta)$

$$2\left(\cos\left(-\frac{\pi}{10}\right) + i\sin\left(-\frac{\pi}{10}\right)\right)$$

iv) $\frac{z_1}{z_2}$ in the form $x + iy$

1.90 - 0.618i

Worked example

$$z_1 = 6\left(\cos\frac{5\pi}{12} - i\sin\frac{5\pi}{12}\right)$$

$$z_2 = 3\left(\cos\frac{3\pi}{4} + i\sin\frac{3\pi}{4}\right)$$

Find:

i) $|z_1 z_2|$

ii) $\arg(z_1 z_2)$

iii) $z_1 z_2$ in the form $r(\cos \theta + i \sin \theta)$

iv) $z_1 z_2$ in the form $x + iy$

Your turn

$$z_1 = 8\left(\cos\frac{7\pi}{10} + i\sin\frac{7\pi}{10}\right)$$

$$z_2 = 4\left(\cos\frac{4\pi}{5} - i\sin\frac{4\pi}{5}\right)$$

Find:

i) $|z_1 z_2|$ 32

ii) $\arg(z_1 z_2)$ $-\frac{\pi}{10}$

iii) $z_1 z_2$ in the form $r(\cos \theta + i \sin \theta)$

$$32 \left(\cos\left(-\frac{\pi}{10}\right) + i \sin\left(-\frac{\pi}{10}\right) \right)$$

iv) $z_1 z_2$ in the form $x + iy$

$$30.4 - 9.89i$$