

1. Let $z_1 = (2, 3)$, $z_2 = (4, 0)$, $z_3 = (-2, -1)$, $z_4 = (-1, .2)$, $z_5 = (-1, .3)$.

- (a) $z_1 + z_3 = ?$ (b) $z_3 z_4 = ?$ (c) $\frac{1}{z_5} = ?$ (d) $|z_1| = ?$
(e) Find the principal argument of $z_1 z_2$, $z_3 z_4$ and $z_4 z_5$.

2. Find the real and imaginary parts of

$$\frac{2 + i - 3i^2 + i^3 + 6i^4 - 2i^5}{2 + i^2 + i^3 + 5i^6}$$

3. Find the real and imaginary parts of $z_1 = 2e^{1.1i}$ and $z_2 = -.6e^{-2i}$.

4. The power-series definition for the complex function $\cos(z)$ is

$$\cos(z) = \sum_{n=0}^{\infty} (-1)^n \frac{z^{2n}}{(2n)!}$$

Use this power-series to show that for any real number t , $\cos(it) = \cosh(t)$.