23204 Introduction to Complex Analysis

Sheet 1

Exercise 1

Find zw, z/w, z^{-10} , e^w , sinw, and all values of $\log z$, \sqrt{z} , $\sqrt[3]{z}$ for z = -2i, w = 1 + i.

Exercise 2

Derive a formula for $w = \arcsin z$ in terms of roots and logarithms.

Exercise 3

Sketch the sets of points in the complex plane:

- (i) image of the set $\{z: 0 < \text{Re}z < 1, 0 < \text{Im}z < \pi\}$ under $f(z) = e^z$;
- (ii) 1 < |z+i| < 2;
- (iii) $\operatorname{Re}(iz) \geq 1$.