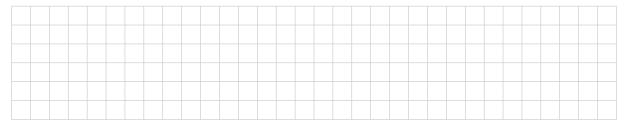
Question 3 (7 marks)

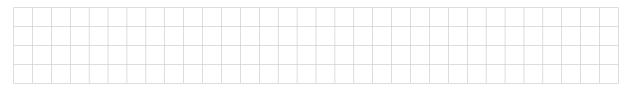
Let  $z_1 = (1-i)^m$  and  $z_2 = (1+i\sqrt{3})^n$ , where m and n are positive integers.

(a) Find  $z_1$  and  $z_2$  in  $r \operatorname{cis} \theta$  form.



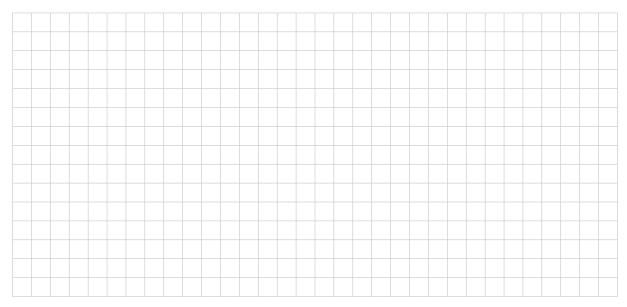
(3 marks)

(b) (i) If  $z_1 = z_2$ , show that m = 2n.



(1 mark)

(ii) Hence find the smallest positive integers m and n such that  $z_1 = z_2$ .



(3 marks)