1.

i. Show that

$$\cos(\left(2cot^{-1}x\right))=\frac{x^{2}-1}{x^{2}+1}$$

ii. Find the angles in the interval 0<$θ<360$ which satisfy the equation

$$cos3θ+cosθ=0$$

iii. Given that $cosθ-\sqrt{3}sinθ=2\cos(\left(θ+β\right))where β is an acute angle.$

Find the minimum of the value

$$\frac{1}{1+|cosθ-\sqrt{2}sinθ|}$$

2.

i. Find the general solution of the equation

$$sin2θ=sinθ$$

ii. Show that

$$\frac{sin2θ+sinθ}{1+cos2θ+cos⁡θ}=tan2θ$$