TEST Number 3, Chapter number 1, Method

Mobeen Munir

www.Mathcity.org

Date 23-11-2009. Total marks 35.

Q: 1 (9 + 9)

(a)Solve the equation

$x^4 - x^3 + x^2 - x + 1 = 0$

(b)If $logsin(x + iy) = u + iv$, *then prove that*

(1)$cosh2y = cos2x + 2e^{2u}$

(2)$e^{2y} = \frac{cos(x-v)}{cos(x+v)}$.

Q: 2 (8 + 9)

Prove analytically if z_1 *and* z_2 *complex numbers then*

(a)$|| Z_1 | - | Z_2 || \leq | Z_1 + Z_2 | \leq | Z_1 | + | Z_2 |$

(b) Prove that $[(cos\Theta - cos\Phi) + i(sin\Theta - sin\Phi)]^n + [(cos\Theta - cos\Phi) - i(sin\Theta - sin\Phi)]^n = 2^{(n+1)} sin^n(\frac{\Theta-\Phi}{2}) cosn(\frac{\Theta+\Phi+\pi}{2})$