

MATH 2415 Test 2 Name: _____

1. Convert the point $(\rho, \varphi, \theta) = (5, \pi/6, -3\pi/4)$ to rectangular coordinates. Then find the distance from that point to the plane $x + y = 1 + z$.

2. Given the parametric curve $\mathbf{r} = \langle t^3, 4t, 7 - t \rangle$, circle TWO of the three problems below and solve them.

- (i) Find the (approximate) arc length from $t = 0$ to $t = 1$.
- (ii) Find the rate of change of speed at $t = 2$.
- (iii) Find the unit normal vector at $t = 2$.