

CALCULUS II 2014 Fall Midterm Exam	Dept. or School		Year		proctor	
	Student ID		Name			
<p>※ Your answer must be provided with descriptions how to get the answer.</p> <p>1. Let the three points be $A(1,1,1)$, $B(1,1,2)$, $C(3,-1,2)$. (1) (3 points) Find the value of t so that the four points A, B, C, and $D(t, t^2, t^3)$ lie in the same plane.</p> <p>(2) (3 points) Find the volume of the tetrahedron whose points are A, B, C, and $D(1,2,3)$ (Hint. A tetrahedron is a solid with four points A, B, C, and D, and four triangular faces).</p>						
<p>2.(1)(3 points) Find parametric equations for the line l in which the two planes $3x - 6y - 2z - 3 = 0$ and $2x + y - 2z - 2 = 0$ intersect.</p> <p>(2)(3 points) Find the distance from the point $S(1,2,3)$ to the line l.</p>						

3.(7 points) The point $(1, \frac{\pi}{2}, \frac{2}{3}\pi)$ is given in spherical coordinates.

Find an equation in spherical coordinates for the largest sphere that passes through the point $(4, \frac{\pi}{2}, \frac{2}{3}\pi)$ and is such that each of the points (ρ, θ, ϕ) inside the sphere satisfies the condition

$$\rho^2 < 40 + 2\rho[\sin\phi(\cos\theta + \sqrt{3}\sin\theta) - \cos\phi]$$

4.(7 points) Let C be the curve of intersection of the plane $y = \sqrt{3}z$ and the cylinder $x^2 + 4z^2 = 4$.

Find parametric equations for the tangent line to the curve C at the point $(-2, 0, 0)$.

