MATH 222 SPRING 2017

EXAM 1

Your name:

Recitation instructor name:

Recitation time:

Problem	1	2	3	4	5	6	7	Total
Grade								

Problem 1.(14 pts) Find the projection of $\vec{v} = 2i + 3j + 4k$ onto $\vec{u} = i + j + k$.

Problem 2. (14 pts) Find the area of the triangle with the vertices $A(1, 0, 0)$, $B(0, 2, 0)$ and $C(0, 0, 3)$.

Problem 3. (14 pts) Find the angle between the vectors $\vec{u} = i - 2j + 2k$ and $\vec{v} = 6i + 3j + 2k$. Give the answer in terms of inverse trigonometric functions.

Problem 4. (14 pts) Find an equation of the plane passing through the points $A(1, 1, 1)$, $B(1, 2, 3)$ and $C(2, 1, 2)$.

Problem 5. (14 pts) Find the distance from the origin $O(0,0,0)$ to the line L given by the parametric equations

$$\begin{cases} x = 1 + t, \\ y = 2 + t, \\ z = 3 + t. \end{cases}$$

Problem 6. (14 pts) Find the distance from the origin $O(0,0,0)$ to the plane P given by the equation

$$x + 2y + 2z + 1 = 0.$$

Problem 7. (16 pts) A quadric surface is given in cylindrical coodinates (r, θ, z) by the equation

$$z = r^2(1 + \sin^2 \theta).$$

Write an equation of the surface in rectangular coordinates (x, y, z). Classify the surface (as an ellipsoid, a hyperboloid or a paraboloid).