Student No: _____
Name: _____
Surname: _____
Signature: _____

Time: April 27, 12:15
Duration: 15 min.
Weight: 10 points
Score: _____

MATH 118 - 2018 Spring
Section-24 Quiz-5

1. (5pts) Let $\vec{u} = (-1, 2, 1)$ and $\vec{v} = (3, 1, 1)$ be two vectors. Find the angle between $\vec{u}$ and $\vec{v}$.
2. (5pts) Identify the surface represented by the equation

$$x^2 - y^2 + z^2 - 2x + 2y + 4z + 2 = 0.$$

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Note: *Show all your work as is done in the lectures.*

ANSWER

1- $\vec{u} \cdot \vec{v} = (-1, 2, 1) \cdot (3, 1, 1)$

$= -3 + 2 + 1 = 0$

Thus, $\vec{u}$ and $\vec{v}$ are perpendicular

2- $x^2 - y^2 + z^2 - 2x + 2y + 4z + 2 = 0$

$\Leftrightarrow x^2 - 2x + 1 - (y^2 - 2y + 1) + z^2 + 4z + 4 = 2$

$\Leftrightarrow (x-1)^2 - (y-1)^2 + (z+2)^2 = 2$

$\Leftrightarrow \frac{(x-1)^2}{2} - \frac{(y-1)}{2} + \frac{(z+2)^2}{2} = 1$

This is a hyperboloid of one sheet centered at $(1, 1, -2)$