King Saud university **Second semester, 1431H**

The First Midterm Exam **Math 202**

Time: 90 Minutes

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Question No.1

Determine whether the following statements are true or false, and justify your answer:

(a) $2\vec{i} - 2\vec{j}$ is a unit vector.

(b) $\vec{i}$ and $\vec{k}$ are orthogonal.

(c) The graph of $\frac{-x^2}{a^2} - \frac{y^2}{b^2} = 1$, is hyperbola.

(d) $(\vec{i} \times \vec{j}) \times \vec{k} = 1$.

(e) The planes $2x - 3y - z - 5 = 0$ and $-4x + 6y + 2z - 1 = 0$ are parallel.

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Question No.2

(a) Find the area of triangle determined by $P(1, 0, -5)$, $Q(-2, 1, 0)$ and $R(3, 2, 1)$.

(b) If $\vec{a} = 3i - j - 4k$, $\vec{b} = 2i + 5j - 2k$ and $\vec{c} = -i + 6k$, find $\text{Comp}_{\vec{b}} \quad (\vec{b} \times \vec{c})$.

(c) Find an equation of the plane through $A(-2, 5, -8)$ and parallel to XY- plane, and find the distance from $C(1, 1, -1)$ to the plane.

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Question No.3

Sketch the graph of the quadric surface

$$y^2 + \frac{z^2}{4} - x^2 = 1$$

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Good luck