A Quick Review of a few Topics from Calculus 3- HW Problems

1. Find a vector equation and parametric equations for a line passing through $(-1, 2, 3)$ in the direction of $\vec{v} = \vec{\imath} + 2\vec{\jmath} - \vec{k}$.

2. Find a vector equation of a line through the points $(2, -3, 1)$ and $(-1, 1, 4)$.

3. Calculate $\|\vec{v}\|$, $\|\vec{w}\|$, and $\vec{v} \cdot \vec{w}$, if $\vec{v} =< 1, 2, -2 >$ and $\vec{w} =< -2, 3, 1 >$.

4. Find a unit vector in the direction of $\vec{v} =< -1, -2, 2 >$.

5. Find all values of x such that the vectors $\vec{v} =< 1, x, x >$ and $\vec{w} =< 5, -6, x >$ are perpendicular.

6. Find an equation of a plane that passes through the points $(2, 1, 1)$, $(3, 3, 2)$, $(5, -2, -2)$.

7. Sketch a rough graph of the following equations in $\mathbb{R}^3$.

$a.\quad z = 4x^2$

$b.\quad z = 4x^2 + 4y^2$

$c.\quad z^2 = 4x^2 + 4y^2$

$d.\quad 1 = 4x^2 + 4y^2$

$e.\quad 4x^2 + 4y^2 + 4z^2 = 64.$