Name: Key

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MAC 2313.9722

Cyr

Quiz 2
You must show all work to receive full credit!!

Problem 1. (4 points) Find a vector equation for the line segment from the point $(-2, 8, 3)$ to the point $(1, -4, 8)$.

Direction vector $\hat{v} = \langle 1, -4, 8 \rangle - \langle -2, 8, 3 \rangle = \langle 3, -12, 5 \rangle$

$\hat{r}(t) = \hat{v}_0 + t\hat{v} = \langle -2, 8, 3 \rangle + t\langle 3, -12, 5 \rangle$

$\qquad = \boxed{\langle -2 + 3t, \ 8 - 12t, \ 3 + 5t \rangle, \quad 0 \le t \le 1}$

Problem 2. (6 points) Consider the quadric surface given by the equation
$$9y^2 + 4z^2 - x^2 = 36.$$

(a) Identify the type of (two-dimensional) curve given by the traces $y = 0, z = 0$, and $x = 0$.

(b) Use the information from part (a) to classify the surface.

(c) Sketch a graph of the surface.

(a) $y = 0$: $\quad 4z^2 - x^2 = 36 \quad$ hyperbola

$\quad z = 0$: $\quad 9y^2 - x^2 = 36 \quad$ hyperbola

$\quad x = 0$: $\quad 9y^2 + 4z^2 = 36 \quad$ ellipse

(b) Hyperboloid of 1 sheet
(x-axis the central axis)

(c)

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