Name _____

Homework 3
Sections 13.3, 13.4, & 17.1

1. (2) Find a unit vector that points from $(1, 9, -4)$ toward $(8, 3, -2)$.

2. (5) Consider the vectors $\vec{c} = 6\vec{i} - 4\vec{j} + 2\vec{k}$ and $\vec{d} = 3\vec{i} + 2\vec{j} + 7\vec{k}$. Determine the component of $\vec{c}$ that is parallel to $\vec{d}$.

3. (3) Given the vectors $\vec{v} = 5\vec{i} + 2\vec{j} + 6\vec{k}$ and $\vec{w} = 3\vec{i} + \vec{j} - 4\vec{k}$, compute $\vec{v} \times \vec{w}$.

4. (5) Determine the equation of the plane which passes through the points $(3, 2, 4)$, $(1, 5, 10)$ and $(4, -2, 5)$. Write your answer in the form $ax + by + cz = d$.

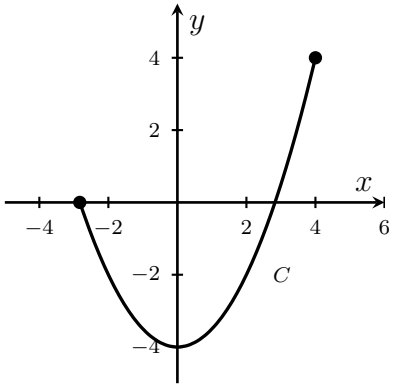
5. (2ea) Determine a parameterization for each of the following.

(a) The line through the points $(4, -2, -1)$ and $(1, 6, 9)$.

(b) The circle of radius 4, parallel to the xz-plane, centered at $(5, 3, -1)$.

(c) The line segment from $(-5, 2, 3)$ to $(9, 10, -4)$.

(d) The portion of the graph of $y = \frac{1}{2}x^2 - 4$ shown below.



(e) The line through the points $(4, 6, 2)$ and $(-1, 6, 9)$.