Vectors in the Plane and Three-Space- HW Problems

Sketch the vectors $\vec{v}$, $\vec{w}$, $\vec{v}+\vec{w}$, and $\vec{v}-\vec{w}$.

1. $\vec{v} =< 2, -3 >$, $\vec{w} =< -1, 5 >$
2. $\vec{v} =< 1, -2, 4 >$, $\vec{w} =< 3, 3, -2 >$

Write a vector equation and parametric equations of a line through the following points.

3. $(2, -3)$, $(-1,5)$
4. $(1, -2, 4)$, $(3, 3, -2)$

5. Find a vector equation and parametric equations of a line through the point $(2, -3, 1)$ in the direction of $\vec{v} =< 4, 1, -2 >$.

6. Find the points of intersection of the line given by

$$x = 4 - 2t, \quad y = -2 + 4t, \quad z = 9 + 3t$$

with the 3 coordinate planes.

7. Write a vector equation of the line segment from $(-1, 2, 4)$ to $(4, 3, -2)$.

8. Determine if the lines below intersect. If they do, find the point of intersection.

$$x = 2t + 1 \qquad x = 3s + 2$$
$$y = -t + 4 \qquad y = 4s - 2$$
$$z = 3t + 1 \qquad z = 6s + 1.$$

9. Show that the lines below are parallel.

$$x = 2t + 1 \qquad x = 6s + 1$$
$$y = -t + 4 \qquad y = -3s - 2$$
$$z = 3t + 1 \qquad z = 9s + 1.$$