

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Find parametric equations for the line that passes through the points  $A(2, 3, -1)$  and  $B(5, 1, 2)$

$$\vec{v} = \vec{AB} = \langle 3, -2, 3 \rangle$$

$$\vec{r} = \vec{r}_0 + \vec{v}t$$

vector equation: 
$$\vec{r} = \langle 2, 3, -1 \rangle + \langle 3, -2, 3 \rangle t$$

parametric equations

$$x = 2 + 3t$$

$$y = 3 - 2t$$

$$z = -1 + 3t$$

Beautiful!

2. Find an equation for the plane through the point  $(2, 3, -1)$  with normal vector  $\mathbf{v} = \langle -3, -1, 2 \rangle$ .

plane is defined by a point + a vector orthogonal to it.

$$\langle \vec{r} - \vec{r}_0 \rangle \cdot \hat{n} = 0$$

$$(\vec{r} - \langle 2, 3, -1 \rangle) \cdot \langle -3, -1, 2 \rangle = 0$$

Great