Answer on Question #52770, Math, Other

Task: The position vectors of the points A and B are (1,5,3) and (3,6,6). Find the vector equation of the line AB and the points where the line intersects the coordinate planes.

Answer:

Find a direction vector.

$$\vec{m} = O\vec{B} - O\vec{A} = [3,6,6] - [1,5,3] = [2,1,3]$$

the vector equation of the line AB is $[x, y, z] = [1,5,3] + t \cdot [2,1,3]$;

so x=1+2t; y=5+t ; z=3+3t.

for the x-z plane, y=0, so 5+t=0, meaning that t=−5. So We get (−9,0,−12).

for the x-y plane, z=0, so 3+3t=0, meaning that t=−1. So We get (−1,4,0).

for the y-z plane, x=0, so 1+2t=0, meaning that t=−1/2. So We get (0,9/2,3/2).