

Answer on question #68629, Math / Other

Question Find the point of intersection the plane $3x-y+2z-3=0$ and the straight line $(x+1)/3=(y+1)/2=(z-1)/-2$

Solution We find this point by solving system of equations

$$3x - y + 2z - 3 = 0$$

$$(x + 1)/3 = (y + 1)/2$$

$$(y + 1)/2 = (z - 1)/-2$$

From first:

$$y = 3x + 2z - 3$$

Substituting into second and third

$$(x + 1)/3 = (3x + 2z - 2)/2$$

$$(3x + 2z - 2)/2 = (1 - z)/2$$

From last one:

$$3x + 2z - 2 = 1 - z$$

$$x + z = 1$$

$$z = 1 - x$$

Hence

$$(x + 1)/3 = (3x + 2 - 2x - 2)/2$$

$$(x + 1)/3 = x/2$$

$$3x = 2x + 2$$

$$x = 2$$

Then

$$z = 1 - 2 = -1$$

$$y = 3 \cdot 2 + 2 \cdot (-1) - 3 = 1$$

Coordinates of point is (2,1,-1).