

Answer to Question #91552 – Math – Analytic Geometry

P(2,1,0) , Q(-1,3,4)

Let R be (x,y,z)

Using section formula:-

$$x = \frac{mx_2 + nx_1}{m+n} = \frac{1(-1) + 2(2)}{1+2} = \frac{-1+4}{3} = 1$$

$$y = \frac{my_2 + ny_1}{m+n} = \frac{1(3) + 2(1)}{1+2} = \frac{3+2}{3} = \frac{5}{3}$$

$$z = \frac{mz_2 + nz_1}{m+n} = \frac{1(4) + 2(0)}{1+2} = \frac{4+0}{3} = \frac{4}{3}$$

So, R(1, $\frac{5}{3}$, $\frac{4}{3}$)

Given parallel line: $\frac{x}{2} = \frac{y}{1} = \frac{z}{2}$

Parallel vector = $\langle a, b, c \rangle = \langle 2, 1, 2 \rangle$

From R, $x_o = 1$, $y_o = \frac{5}{3}$, $z_o = \frac{4}{3}$

Thus, equation for required line :

$$\frac{x-x_o}{a} = \frac{y-y_o}{b} = \frac{z-z_o}{c}$$

$$= \frac{x-1}{2} = \frac{y-\frac{5}{3}}{1} = \frac{z-\frac{4}{3}}{2}$$

$$= \frac{x-1}{2} = \frac{3y-5}{3} = \frac{3z-4}{6}$$