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Line Assignment

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Problem Statement:

A straight line through origin O meets the parallel lines 4x+2y=9 and 2x+y+6=0 at points **P** and **Q** respectively,then point O divides the segment PQ in the ratio:

Solution:

Given,A straight line passing through origin meets(intersects)the two parallel lines at point P and Q. respectively.

O-origin.
P-point of intersection of straight line and 2(2x+y)=9.
Q-point of intersection of straight line and 2x+y+6=0.

To Find:

The ratio in which point O divides the line segment PQ. i.e the distance between OP and OQ

The equation of the line:

$$\mathbf{n}^\top \mathbf{x} = C$$

The Point O divides the line segment PQ in the ratio,
OP : OQ

Distance from origin to the line::

d_1 = Distance from O to P
d_2 = Distance from O to Q

$$\mathbf{d_1} = \frac{|c_1|}{\|\mathbf{n}\|} \tag{1}$$

$$\mathbf{d_2} = \frac{|c_2|}{\|\mathbf{n}\|} \tag{2}$$

$$\mathbf{d_1} : \mathbf{d_2} = \frac{|c_1|}{\|\mathbf{n}\|} : \frac{|c_2|}{\|\mathbf{n}\|} \tag{3}$$

$$\mathbf{d} = |c_1| : |c_2| \tag{4}$$

$$\mathbf{d} = 3 : 4 \tag{5}$$

$$\mathbf{d} = 0.75 \tag{6}$$

Result