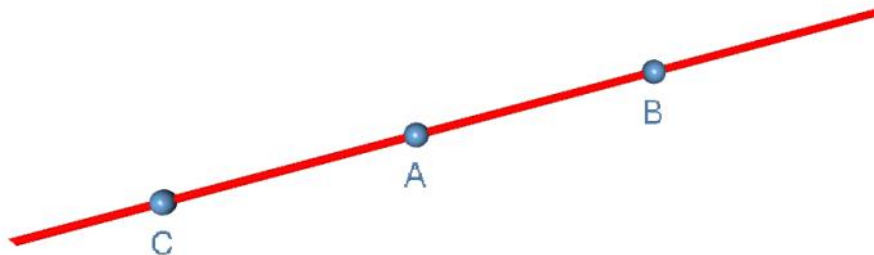


$A(3,-1,2)$  and  $B(6,-7,-7)$  lie on a straight line  $L$ .  $C$  also lies on the straight line  $L$ .

Find the coordinates of the point  $C$  given that  $|\overrightarrow{AC}| = |\overrightarrow{AB}|$ .



$$\mathbf{r} = \mathbf{a} + \lambda \mathbf{b}$$

$$\overrightarrow{AB} = \overrightarrow{OB} - \overrightarrow{OA}$$

$$\overrightarrow{AB} = \begin{pmatrix} 6 \\ -7 \\ -7 \end{pmatrix} - \begin{pmatrix} 3 \\ -1 \\ 2 \end{pmatrix} = \begin{pmatrix} 3 \\ -6 \\ -9 \end{pmatrix}$$

$$\mathbf{r} = \begin{pmatrix} 3 \\ -1 \\ 2 \end{pmatrix} + \lambda \begin{pmatrix} 3 \\ -6 \\ -9 \end{pmatrix}$$

$$\overrightarrow{OB} = \begin{pmatrix} 3 \\ -1 \\ 2 \end{pmatrix} + (\mathbf{1}) \begin{pmatrix} 3 \\ -6 \\ -9 \end{pmatrix}$$

$$\overrightarrow{OC} = \begin{pmatrix} 3 \\ -1 \\ 2 \end{pmatrix} + (-\mathbf{1}) \begin{pmatrix} 3 \\ -6 \\ -9 \end{pmatrix} \qquad \overrightarrow{OC} = \begin{pmatrix} 0 \\ 5 \\ 11 \end{pmatrix}$$

$C(0,5,11)$

Check

Find the midpoint of  $B(6,-7,-7)$  and  $C(0,5,11)$

$$\left( \frac{6+0}{2}, \frac{-7+5}{2}, \frac{-7+11}{2} \right)$$

$A(3, -1, 2)$