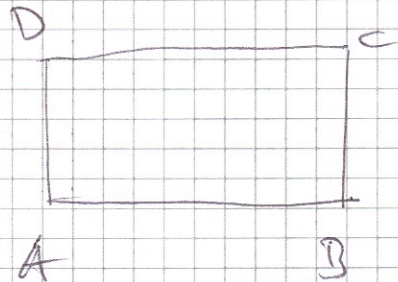


TBM SA, 15. 11. 2013

(4)

$$\vec{AB} = \vec{r}_B - \vec{r}_A = \begin{pmatrix} -16 \\ 8 \\ -2 \end{pmatrix}$$
$$|\vec{AB}| = \sqrt{16^2 + 8^2 + 2^2} = \sqrt{324} = 18$$
$$\vec{v} = \frac{1}{18} \cdot \vec{AB} = \begin{pmatrix} -8/9 \\ 4/9 \\ -1/9 \end{pmatrix}$$
$$\vec{w} = \frac{3}{18} \vec{AB} = \frac{1}{6} \vec{AB} = \begin{pmatrix} -8/3 \\ 4/3 \\ -1/3 \end{pmatrix}$$

(5)



$$\vec{r}_D = \vec{r}_A + \vec{AD}$$

$$\vec{AD} = \vec{BC} = \vec{r}_C - \vec{r}_B$$

$$\vec{r}_D = \vec{r}_A + (\vec{r}_C - \vec{r}_B)$$

$$\vec{r}_D = \vec{r}_A + \vec{r}_C - \vec{r}_B = \begin{pmatrix} 9 \\ -5 \\ 4 \end{pmatrix}; \underline{\underline{D(9/-5/4)}}$$

$$\vec{AB} = \vec{r}_B - \vec{r}_A = \begin{pmatrix} 12 \\ 16 \\ 0 \end{pmatrix}; |\vec{AB}| = \sqrt{12^2 + 16^2} = \sqrt{400} = 20$$

$$\vec{BC} = \vec{r}_C - \vec{r}_B = \begin{pmatrix} 8 \\ -6 \\ 0 \end{pmatrix}; |\vec{BC}| = \sqrt{8^2 + 6^2} = 10$$

$$A = 10 \cdot 20 = \underline{\underline{200}}$$

$$\textcircled{6} \quad \vec{r}_P = \begin{pmatrix} 0 \\ 0 \\ z \end{pmatrix}$$

$$\vec{AP} = \vec{r}_P - \vec{r}_A = \begin{pmatrix} -11 \\ -8 \\ z+9 \end{pmatrix}$$

$$\vec{BP} = \vec{r}_P - \vec{r}_B = \begin{pmatrix} -6 \\ 3 \\ z-5 \end{pmatrix}$$

$$\overline{AP} = 3 \cdot \overline{BP}$$

$$\left| \begin{pmatrix} -11 \\ -8 \\ z+9 \end{pmatrix} \right| = 3 \left| \begin{pmatrix} -6 \\ 3 \\ z-5 \end{pmatrix} \right|$$

$$\sqrt{z^2 + 18z + 266} = 3 \sqrt{z^2 - 10z + 70}$$

$$z^2 + 18z + 266 = 9z^2 - 90z + 630$$

$$4z^2 - 54z + 182 = 0$$

$$z_1 = 7 \quad P_1(0|0|7)$$

$$z_2 = \frac{13}{2} \quad P_2(0|0|\frac{13}{2})$$