Solution to 1.2.1

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Question: If **D** divides BC in the ratio k:1,

$$\mathbf{D} = \frac{k\mathbf{C} + \mathbf{B}}{k+1} \tag{1}$$

Find the mid points \mathbf{D} , \mathbf{E} , \mathbf{F} of the sides BC, CA and AB respectively.

Given:

$$\mathbf{A} = \begin{pmatrix} 1 \\ -1 \end{pmatrix} \tag{2}$$

$$\mathbf{B} = \begin{pmatrix} -4\\6 \end{pmatrix} \tag{3}$$

$$\mathbf{C} = \begin{pmatrix} -3\\ -5 \end{pmatrix} \tag{4}$$

Solution: Since \mathbf{D} is the midpoint of BC,

$$z = 1 \tag{5}$$

$$\implies \mathbf{D} = \frac{\mathbf{C} + \mathbf{B}}{2} \tag{6}$$

$$=\frac{1}{2} \begin{pmatrix} -7\\1 \end{pmatrix} \tag{7}$$

Similarly,

$$\mathbf{E} = \frac{\mathbf{A} + \mathbf{C}}{2} \tag{8}$$

$$= \begin{pmatrix} -1 \\ -3 \end{pmatrix}$$
 (9)
$$\mathbf{F} = \frac{\mathbf{A} + \mathbf{B}}{2}$$
 (10)

$$\mathbf{F} = \frac{\mathbf{A} + \mathbf{B}}{2}$$
 (10) Fig. 0. Triangle ABC with midpoints D,E and F

$$=\frac{1}{2} \begin{pmatrix} -3\\ 5 \end{pmatrix} \tag{11}$$

