ASSIGNMENT 1

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Download all latex-tikz codes from

https://github.com/vishwahurakadli/EE3900/blob/main/Assignment_1/Assignment_1.tex

1 Problem

(Vectors-2.20) If

$$\mathbf{P} = 3\mathbf{a} - 2\mathbf{b} \tag{1.0.1}$$

$$\mathbf{Q} = \mathbf{a} + \mathbf{b} \tag{1.0.2}$$

find R. which divides PQ in the ratio 2 : 1

1) internally
2) externally

2 Solution

1) section formula for internal division for ratio m : n is given by

$$\mathbf{I} = \frac{m \times \mathbf{A} + n \times \mathbf{B}}{m + n} \tag{2.0.1}$$

so for ratio 2 : 1 R will be given by

$$\mathbf{R} = \frac{2 \times (3\mathbf{a} - 2\mathbf{b}) + (\mathbf{a} + \mathbf{b})}{2 + 1} \tag{2.0.2}$$

$$\mathbf{R} = \frac{7\mathbf{a}}{3} - \mathbf{b} \tag{2.0.3}$$

will divide PQ internally

2) similarly section formula for external division for ration m : n is given by

$$\mathbf{E} = \frac{m \times \mathbf{A} - n \times \mathbf{B}}{m - n} \tag{2.0.4}$$

so for ratio 2 : 1 R will be given by

$$\mathbf{R} = \frac{2 \times (3\mathbf{a} - 2\mathbf{b}) - (\mathbf{a} + \mathbf{b})}{2 - 1} \tag{2.0.5}$$

$$\mathbf{R} = 5\mathbf{a} - 5\mathbf{b} \tag{2.0.6}$$

will divide PQ externally