

# Assignment 4

Kavya Kamal

Download all python codes from

<https://github.com/kavyakamal66/IITH-INTERNSHIP/blob/main/Assignment4/code4.py>

and latex-tikz codes from

<https://github.com/kavyakamal66/IITH-INTERNSHIP/blob/main/Assignment4/assignment4.tex>

## 1 QUESTION NO. 2.11 - VECTORS

Find the condition on  $\mathbf{x}$  such that the points

$\mathbf{x}, \begin{pmatrix} 1 \\ 2 \end{pmatrix}, \begin{pmatrix} 7 \\ 0 \end{pmatrix}$  are collinear.

## 2 SOLUTION

Let

$$\mathbf{A} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 7 \\ 0 \end{pmatrix} \quad (2.0.1)$$

The parametric equation of the line is

$$\mathbf{x} = \mathbf{A} + \lambda \mathbf{m} \quad (2.0.2)$$

where  $\mathbf{m}$  is the direction vector and  $\mathbf{A}$  is any point on the line.

Then direction vector,  $\mathbf{m}$  of line AB is

$$\mathbf{m} = \mathbf{B} - \mathbf{A} = \begin{pmatrix} 6 \\ -2 \end{pmatrix} \quad (2.0.3)$$

Substituting values in (2.0.2)

$$\mathbf{x} = \lambda \begin{pmatrix} 6 \\ -2 \end{pmatrix} + \begin{pmatrix} 1 \\ 2 \end{pmatrix} \quad (2.0.4)$$