# Assignment 2

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Download all python codes from

https://github.com/mirhasidheek7213/InternshipIITH/tree/main/Assignment−2/Codes

and latex-tikz codes from

https://github.com/mirhasidheek7213/InternshipIITH/blob/main/Assignment−2/Assignment2.tex

## 1 Question No. 1.23 - Linear forms

Find the equation of the line, which makes intercepts $-3$ and $2$ on the $x$ and $y$ axes respectively.

## 2 Solution

$$Given, x-intercept = -3, y-intercept = 2 \quad (2.0.1)$$

Hence , the line cuts through the x-axis at $\begin{pmatrix}-3\\0\end{pmatrix}$ and the line cuts through the y-axis at $\begin{pmatrix}0\\2\end{pmatrix}$

$$A = \begin{pmatrix}-3\\0\end{pmatrix}, B = \begin{pmatrix}0\\2\end{pmatrix} \quad (2.0.2)$$

Equation of a line is,

$$r = A + \lambda(B - A) \quad (2.0.3)$$

$$B - A = \begin{pmatrix}0-(-3)\\2-0\end{pmatrix} \quad (2.0.4)$$

$$= \begin{pmatrix}3\\2\end{pmatrix} \quad (2.0.5)$$

Hence, the equation of line by substituting 2.0.5 is,

$$r = \begin{pmatrix}-3\\0\end{pmatrix} + \lambda\begin{pmatrix}3\\2\end{pmatrix} \quad (2.0.6)$$

Since the line passes through the points $\begin{pmatrix}-3\\0\end{pmatrix}$ and $\begin{pmatrix}0\\2\end{pmatrix}$, The line AB is plotted using these points as shown below.

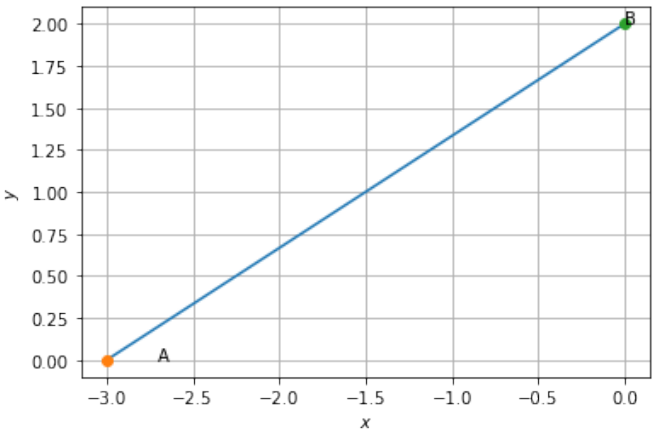


Fig. 0: The line $r = \begin{pmatrix}-3\\0\end{pmatrix} + \lambda\begin{pmatrix}3\\2\end{pmatrix}$