

# Matrix-Lines

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Symbol	Value	Description
P	$\begin{pmatrix} 0 \\ -4 \end{pmatrix}$	Point on Y-axis
B	$\begin{pmatrix} 8 \\ 0 \end{pmatrix}$	Point on X-axis
O	$\begin{pmatrix} 0 \\ 0 \end{pmatrix}$	Origin

TABLE I  
PARAMETERS

## I. PROBLEM STATEMENT

Find the slope of a line, which passes through the origin and the mid point of the line segment joining the points P(0,-4) and B(8,0)

## II. CONSTRUCTION

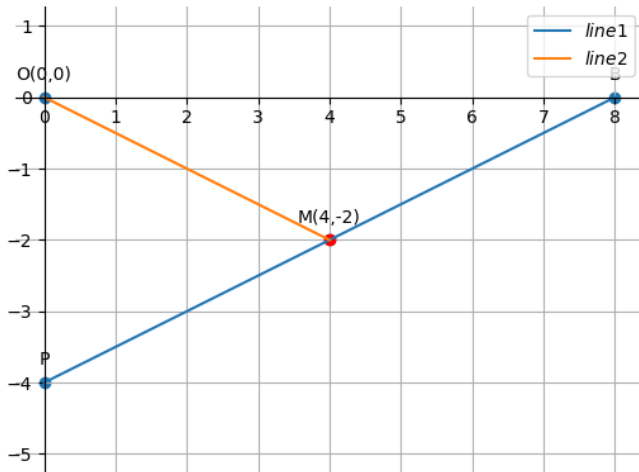


Fig. 1. Equation of the slope

## III. SOLUTION

Given that resultant line passes through origin and mid point of the line segment joining point P(0,-4) and B(8,0)

given  $P = \begin{pmatrix} 0 \\ -4 \end{pmatrix}$ ,  $B = \begin{pmatrix} 8 \\ 0 \end{pmatrix}$   
The mid point of PB line:

$$\Rightarrow M = \frac{1}{2}(P + B) \quad (1)$$

$$\Rightarrow M = \begin{pmatrix} 4 \\ -2 \end{pmatrix} \quad (2)$$

The direction vector of line joining two points O,M is given by

$$\Rightarrow m = O - M \quad (3)$$

$$\Rightarrow m = \begin{pmatrix} 4 \\ -2 \end{pmatrix} \quad (4)$$

By simplifying eq(4),we get

$$\Rightarrow m = \begin{pmatrix} 1 \\ -0.5 \end{pmatrix} \quad (5)$$

The direction vector of a line expressed as

$$\Rightarrow m = \begin{pmatrix} 1 \\ m \end{pmatrix} \quad (6)$$

By solving equation (5) and (6),we get the slope of O M line

$$\boxed{m = -0.5} \quad (7)$$

#### IV. SOFTWARE

Download the following code using,

```
https://github.com/jyothsna777/jyothsna-fwc.git
```

and execute the code by using command

**Python3 lines.py**

#### V. CONCLUSION

Hence the slope of line O M line is  $m=-0.5$