MATRIX THEORY

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1 Question 43, P.59

1.1 CODE:-

```
def print_value(x):

  #slope of line @ Origin
  m_origin=x[1]/x[0]

  #slope of the required line
  m_line= -1/m_origin

  #required constant of the line
  c_line =x[1]-m_line*x[0]

  #printing the value of line slope and the constant
  print("the slope of m in the line is",m_line)
  print("the value of c in the line is", c_line)

x=[-1, 2]
print_value(x)
```

1.2 Explanation

The line through the origin perpendicular to the given line is in the form of $y = \hat{m}x$. Since this line passes through [-1,2]. Therefore,

$$\hat{m} = \frac{y}{x} = \frac{2}{-1} = -2 \tag{1}$$

Therefore, the slope of the required line

$$\begin{aligned} \hat{m}m &= -1 \\ \implies m &= \frac{-1}{\hat{m}} \\ \implies m &= 0.5 \end{aligned} \tag{2}$$

The required constant value in the line is given by

$$\begin{aligned} & c = y - mx \\ \implies & c = 2 - 0.5x(-1) = 2.5 \\ \implies & c = 2.5 \end{aligned} \tag{3}$$

Hence, the value of m and c is obtained from (2) and (3) as 0.5 and 2.5 respectively.