

# Linear Equations In Two Variables

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## Class No<sup>th</sup> Maths - Chapter 3

This is Problem-3 from Exercise 3.1

1. The cost of 2kg of apples and 1kg of grapes on a day was found to be Rs.160 . After a month, the cost of 4kg apples and 2kg of grapes is Rs.300. Represent the situation algebraically and geometrically.

**Solution:**

Let us take cost of apples  $x$  and that of grapes as  $y$  Therefore,

$$2x + y = 160 \quad (1)$$

$$4x + 2y = 300 \quad (2)$$

$$(3)$$

The equations can also be written as:

$$\begin{pmatrix} 2 & 1 \\ 4 & 2 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 160 \\ 300 \end{pmatrix} \quad (4)$$

$$(5)$$

$$x = \frac{\begin{vmatrix} \mathbf{b} & \mathbf{a}_2 \end{vmatrix}}{\begin{vmatrix} \mathbf{a}_1 & \mathbf{a}_2 \end{vmatrix}} = \frac{\begin{vmatrix} 160 & 1 \\ 300 & 2 \end{vmatrix}}{\begin{vmatrix} 2 & 1 \\ 4 & 2 \end{vmatrix}} = \frac{320 - 300}{4 - 4} = \frac{20}{0} \quad (6)$$

Hence, Aftab's age is 42

$$y = \frac{\begin{vmatrix} \mathbf{a_1} & \mathbf{b} \end{vmatrix}}{\begin{vmatrix} \mathbf{a_1} & \mathbf{a_2} \end{vmatrix}} = \frac{\begin{vmatrix} 2 & 160 \\ 4 & 300 \end{vmatrix}}{\begin{vmatrix} 2 & 1 \\ 4 & 2 \end{vmatrix}} = \frac{600 - 640}{4 - 4} = \frac{-40}{0} \quad (7)$$

Hence, no solution exists.