

# Assignment-1

## (ICSE 10, 2019)

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### Problem 4(a):

The following numbers,  $K + 3$ ,  $K + 2$ ,  $3K - 7$  and  $2K - 3$  are in proportion. Find  $K$ .

### Solution:

Given numbers,

$$a_1 = K + 3$$

$$a_2 = K + 2$$

$$a_3 = 3K - 7$$

$$a_4 = 2K - 3$$

For the Proportionality of the numbers, they must satisfy,

$$\frac{a_1}{a_2} = \frac{a_3}{a_4}$$

So we get,

$$\frac{K + 3}{K + 2} = \frac{3K - 7}{2K - 3}$$

By cross multiplication,

$$(K + 3)(2K - 3) = (3K - 7)(K + 2)$$

$$2K^2 + 3K - 9 = 3K^2 - K - 14$$

$$K^2 - 4K - 5 = 0$$

$$K^2 - 5K + K - 5 = 0$$

$$(K - 5)(K + 1) = 0$$

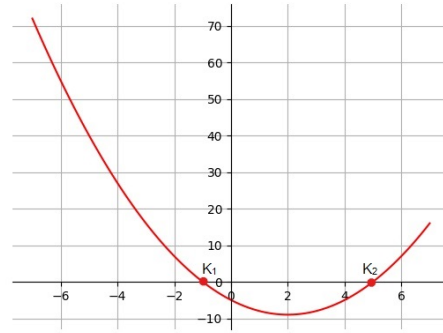


Figure 1: The Polynomial graph

From above,

$$K_1 = -1$$

$$K_2 = 5$$

So  $K$  will either be  $K_1$  or  $K_2$ .

See Figure 1.

The verification python code for the roots is in py-codes folder.