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,

$$(K+3)(2K-3) = (3K-7)(K+2)$$
$$2K^2+3K-9 = 3K^2-K-14$$
$$K^2-4K-5 = 0$$
$$K^2-5K+K-5 = 0$$
$$(K-5)(K+1) = 0$$

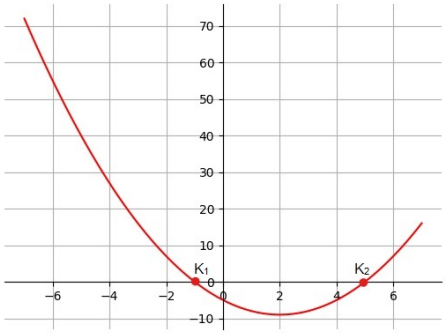

Figure 1: The Polynomial graph

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.