

ASSIGNMENT 1

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Que 10(a): Use remainder theorem to factorize the following polynomial:

$$f(x) = 2x^3 + 3x^2 - 9x - 10.$$

Solution:

$$\text{Let } f(x) = 2x^3 + 3x^2 - 9x - 10$$

Put $x = -1$ we get,

$$\begin{aligned} f(-1) &= 2(-1)^3 + 3(-1)^2 - 9(-1) - 10 \\ &= -2 + 3 + 9 - 10 \\ &= 0 \end{aligned}$$

So, $(x + 1)$ is a factor of $f(x)$.

Dividing $f(x)$ with $(x + 1)$ we get,

$$f(x) = (x + 1)(2x^2 + x - 10)$$

The term $(2x^2 + x - 10)$ can be factorized as

$$\begin{aligned} (2x^2 + 5x - 4x - 10) &= (x - 2)(2x + 5) \\ \therefore f(x) &= (x + 1)(x - 2)(2x + 5) \end{aligned}$$

Hence, $(x + 1)$, $(x - 2)$ and $(2x + 5)$ are the factors of the given polynomial

$$2x^3 + 3x^2 - 9x - 10.$$

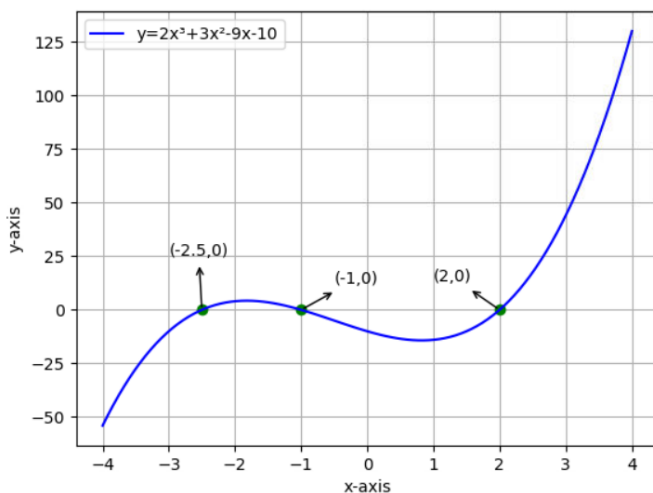


Figure 1: Graph of the polynomial
 $y = 2x^3 + 3x^2 - 9x - 10$