

# 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:** 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

$$(2x^2 + 5x - 4x - 10) = (x - 2)(2x + 5)$$

$$\therefore f(x) = (x + 1)(x - 2)(2x + 5)$$

Hence,  $(x + 1)$ ,  $(x - 2)$  and  $(2x + 5)$  are the factors of the given polynomial  $2x^3 + 3x^2 - 9x - 10$ .

