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