Exercise 2B

Question 8:

First we write the given polynomials in standard form in decreasing order of degree and then perform the division as shown below.

$$
\begin{array}{r|l}
 & 3x - 1 \\
\hline
x^2 - x + 2 & 3x^3 - 4x^2 + 7x - 2 \\
 & +3x^3 - 3x^2 + 6x \\
 & \;\;- \quad\;\; + \quad\;\; - \\
\cline{2-2}
 & \qquad -x^2 + x - 2 \\
 & \qquad -x^2 + x - 2 \\
\cline{2-2}
 & \qquad\quad 0 \\
\end{array}
$$

Clearly degree(of remainder) = 0 < degree $\left(x^2 - x + 2\right)$

$\therefore$ Quotient = $(3x - 1)$, Remainder = 0

$\Rightarrow$ (Quotient $\times$ divisor) + remainder

$$= (3x - 1)\left(x^2 - x + 2\right) + 0$$

$$= 3x^3 - 3x^2 + 6x - x^2 + x - 2 = 0$$

$$= 3x^3 - 4x^2 + 7x - 2 = \text{dividend}$$

Thus, (Quotient $\times$ divisor) + remainder = dividend

Hence, the division algorithm is verified.

Question 9:

First we write the given polynomials in standard form in decreasing order of degree and then perform the division as shown below.

$$
\begin{array}{r|l}
 & 2x+3 \\
\hline
-3x^2+5x+2 & -6x^3+x^2+19x+6 \\
 & -6x^3+10x^2+4x \\
 & +\quad - \quad - \\
\hline
 & \quad -9x^2+15x+6 \\
 & \quad -9x^2+15x+6 \\
 & \quad +\quad - \quad - \\
\hline
 & \qquad 0 \\
\hline
\end{array}
$$

Clearly degree of remainder $= 0 <$ degree $\left(-3x^2+5x+2\right)$

$\therefore$ Quotient $= (2x+3)$, remainder $= 0$

$\Rightarrow$ (Quotient $\times$ divisor) $+$ remainder

$= (2x+3)\left(-3x^2+5x+2\right)+0$

$= -6x^3+10x^2+4x-9x^2+15x+6$

$\therefore -6x^3+x^2+19x+6 =$ dividend

$=$ (Quotient $\times$ divisor) $+$ remainder $=$ Dividend

Hence the division algorithm is verified.

*********** END **********