Exercise 2B

Question 10:

2 is the zero of the polynomial $x^3 - 4x^2 + x + 6$

$\therefore$ x -2 is a factor of it

Dividing the given polynomial by x − 2

$$
\begin{array}{r}
x^2 - 2x - 3 \\
x - 2 \overline{\smash{\big)}\ x^3 - 4x^2 + x + 6} \\
\underline{-x^3 - 2x^2} \\
{\scriptstyle +\quad\ +} \\
-2x^2 + x \\
-2x^2 + 4x \\
\underline{{\scriptstyle +\qquad -}} \\
-3x + 6 \\
\underline{-3x + 6} \\
0
\end{array}
$$

Remainder = 0, Quotient of $q(x) = x^2 - 2x - 3$

Now, $q(x) = x^2 - 2x - 3$

$\qquad = x^2 - 3x + x - 3 = x(x - 3) + (x - 3)$

$\qquad = (x - 3)(x + 1)$

Other zeros of given cubic polynomial are zeros of q(x)

$\therefore$ $q(x) = 0 \Rightarrow (x - 3)(x + 1) = 0$

$\qquad \Rightarrow$ Either $x - 3 = 0$ or $x + 1 = 0$

$\therefore$ Either x = 3 or x = −1

$\therefore$ Other zeros of the given cubic polynomial are 3 and −1

Question 11:

One zero of the polynomial $x^3 + 2x^2 - 11x - 12$ is -1

$\therefore x + 1$ is a factor of $x^3 + 2x^2 - 11x - 12$

Dividing $x^3 + 2x^2 - 11x - 12$ by $x + 1$

$$
\begin{array}{r}
x^2 + x - 12 \\
x + 1 \overline{\smash{\big)}\ x^3 + 2x^2 - 11x - 12} \\
\underline{x^3 + x^2} \\
\quad\ \ {-}\ \ {-} \\
 x^2 - 11x \\
 x^2 + x \\
\quad\quad {-}\ \ {-} \\
 -12x - 12 \\
 \underline{-12x - 12} \\
 0
\end{array}
$$

Quotient $q(x) = x^2 + x - 12$

$ = x^2 + 4x - 3x - 12$

$ = (x + 4)(x - 3)$

Other zeros of given polynomial are the zeros of $q(x)$

$\therefore q(x) = 0$

$\Rightarrow (x + 4)(x - 3) = 0$

$\Rightarrow$ Either $x + 4 = 0$ or $x - 3 = 0$

$\Rightarrow$ Either $x = -4$ or $x = 3$

$\therefore -4, 3$ are the zeros of $q(x)$

$\therefore$ The zeros of given polynomial are $-4, -1$ and 3

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