ANSWER1)
$p(x) = 5 - 4x + 2x^2$

(i) $p(0) = 5 - 4 \times 0 + 2 \times 02 = 5$

(ii) $p(3) = 5 - 4 \times 3 + 2 \times 32$
$= 5 - 12 + 18$
$= 23 - 12 = 11$

(iii) $p(-2) = 5 - 4(-2) + 2(-2)^2$
$= 5 + 8 + 8 = 21$

Answer 2) $p(y) = 4 + 3y - y^2 + 5y^2$

(i) $p(0) = 4 + 3 \times 0 - 02 + 5 \times 03$
$= 4 + 0 - 0 + 0 = 4$

(ii) $p(2) = 4 + 3 \times 2 - 22 + 5 \times 23$
$= 4 + 6 - 4 + 40$
$= 10 - 4 + 40 = 46$

(iii) $p(-1) = 4 + 3(-1) - (-1)^2 + 5(-1)^3 = 4 - 3 - 1 - 5 = -5$

Answer 3) $f(t) = 4t^2 - 3t + 6$

(i) $f(0) = 4 \times 02 - 3 \times 0 + 6$
$= 0 - 0 + 6 = 6$

(ii) $f(4) = 4(4)2 - 3 \times 4 + 6$
$= 64 - 12 + 6 = 58$

(iii) $f(-5) = 4(-5)^2 - 3(-5) + 6$
$= 100 + 15 + 6 = 121$

Answer 4)

$p(x) = x^3 - 3x^2 + 2x$
Thus, we have
$p(0) = 0^3 - 3(0)^2 + 2(0) = 0$
$p(1) = 1^3 - 3(1)^2 + 2(1) = 1 - 3 + 2 = 0$
$p(2) = 2^3 - 3(2)^2 + 2(2) = 8 - 12 + 4 = 0$
Hence, 0, 1 and 2 are the zeros of the polynomial $p(x) = x^3 - 3x^2 + 2x$.

Answer5)

$p(x) = x^3 + x^2 - 9x - 9$
Thus, we have
$p(0) = 0^3 + 0^2 - 9(0) - 9 = -9$
$p(3) = 3^3 + 3^2 - 9(3) - 9 = 27 + 9 - 27 - 9 = 0$
$p(-3) = (-3)^3 + (-3)^2 - 9(-3) - 9 = -27 + 9 + 27 - 9 = 0$
$p(-1) = (-1)^3 + (-1)^2 - 9(-1) - 9 = -1 + 1 + 9 - 9 = 0$
Hence, 0, 3 and -3 are the zeros of p(x).
Now, 0 is not a zero of p(x) since $p(0) \neq 0$.

Answer 6)
i) $p(x) = x - 4$
Then, $p(4) = 4 - 4 = 0$
$\Rightarrow$ 4 is a zero of the polynomial p(x).

ii) $q(x) = x + 3$

Then, $q(-3) = -3 + 3 = 0$
$\Rightarrow$ -3 is not a zero of the polynomial p(x).

iii) $p(x) = 2 - 5x$
Then,

$\Rightarrow \frac{2}{5}$ is a zero of the polynomial p(x).

iv) $p(y) = 2y + 1$
Then,
is $\Rightarrow \frac{-1}{2}$ a zero of the polynomial p(y).

Answer 7)

i) $p(x) = x2 - 3x + 2$

$p(x) = (x - 1)(x - 2)$
Then, $p(1) = (1 - 1)(1 - 2) = 0 \times -1 = 0$

$\Rightarrow$ 1 is a zero of the polynomial p(x).

Also, $p(2) = (2 - 1)(2 - 2) = 1 \times 0 = 0$

⇨ 2 is a zero of the polynomial p(x).
Hence,1 and 2 are the zeroes of the polynomial p(x).

ii) $q(x) = x2 + x - 6$

Then, $q(2) = 22 + 2 - 6$
$= 4 + 2 - 6$
$= 6 - 6 = 0$
⇨ 2 is a zero of the polynomial p(x).
Also, $q(-3) = (-3)2 - 3 - 6$
$= 9 - 3 - 6 = 0$
⇨ -3 is a zero of the polynomial p(x).
Hence, 2 and -3 are the zeroes of the polynomial p(x).

iii) $r(x) = x2 - 3x.$

Then,$p(0) = 02 - 3 \times 0 = 0$

$r(3) = (3)2 - 3 \times 3 = 9 - 9 = 0$

⇨ 0 and 3 are the zeroes of the polynomial p(x).

Answer8)

(i) $p(x) = 0$

⇨ $x - 5 = 0$
⇨ $x = 5$
⇨ 5 is the zero of the polynomial p(x).

(ii) $q(x) = 0$
⇨ is a zero of the polynomial p(y).
⇨ $x + 4 = 0$
⇨ $x = -4$
⇨ -4 is the zero of the polynomial q(x).

(iii) $r(x) = 2x + 5$
Now, $r(x) = 0$
$\Rightarrow 2x + 5 = 0$
$\Rightarrow 2x = -5$

$\Rightarrow x = -\frac{5}{2}$

$\therefore -\frac{5}{2}$ is a zero of the polynomial r(x).

(iv) f(x) = 0

$\Rightarrow$ 3x + 1= 0

⇨ 3x=-1

⇨ x = $\frac{-1}{3}$

⇨ x = $\frac{-1}{3}$ is the zero of the polynomial f(x).

(v) g(x) = 0

⇨ 5 - 4x = 0

⇨ -4x = -5

⇨ x = $\frac{5}{4}$

⇨ x = $\frac{5}{4}$ is the zero of the polynomial g(x).

(vi) h(x) = 6x - 2

Now, h(x) = 0

⇒ 6x - 2 = 0

⇒ 6x = 2

$\Rightarrow x = \frac{2}{6} = \frac{1}{3}$

$\therefore \frac{1}{3}$ is a zero of the polynomial h(x).

(vii) p(x) = 0

⇨ ax = 0

⇨ x = 0

⇨ 0 is the zero of the polynomial p(x).

(viii) q(x) = 0

⇨ 4x = 0

⇨ x = 0

⇨ 0 is the zero of the polynomial q(x).

9) $f(x) = 2x^3 - 5x^2 + ax + b$

Now, 2 is a zero of f(x).
$\Rightarrow f(2) = 0$
$\Rightarrow 2(2)^3 - 5(2)^2 + a(2) + b = 0$
$\Rightarrow 16 - 20 + 2a + b = 0$
$\Rightarrow 2a + b - 4 = 0$ ....(i)
Also, 0 is a zero of f(x).
$\Rightarrow f(0) = 0$
$\Rightarrow 2(0)^3 - 5(0)^2 + a(0) + b = 0$
$\Rightarrow 0 - 0 + 0 + b = 0$
$\Rightarrow b = 0$
Substituting $b = 0$ in (i), we get
$2a + 0 - 4 = 0$
$\Rightarrow 2a = 4$
$\Rightarrow a = 2$
Thus, $a = 2$ and $b = 0$

EXERCISE 2C