(21)

−2	1	−5	6
		−2	14
	1	−7	20

quotient ↑ remainder

∴ quotient = $x - 7$; Remainder = 20

(23)

1	3	−4	1
		3	−1
	3	−1	0

quotient = $3x - 1$; Remainder = 0

(25)

2	1	2	3	4
		2	8	22
	1	4	11	26

quotient = $x^2 + 4x + 11$

(27)

3	3	−1	2	5
		9	24	78
	3	8	26	83

quotient = $3x^2 + 8x + 26$

(29)

1	2	0	1	−3
		2	2	3
	2	2	3	0

quotient = $2x^2+2x = 2x(x+1)$

(31)

−4	1	0	2	0	1
		−4	16	−72	288
	1	−4	18	−72	289

quotient = $x^3 - 4x^2 + 18x - 72$

(33)

2	1	−2	1	−3	−1	1
		2	0	2	−2	−6
	1	0	1	−1	−3	−5

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

(35)

1	1	1	1
		1	2
	1	2	3

quotient = $x+2$

(37)

-1	1	0	0	0	-1
		-1	1	-1	1
	1	-1	1	-1	0

quotient = $x^3 - x^2 + x - 1$

(39)

1	1	0	0	-1
		1	1	1
	1	1	1	0

quotient = $x^2 + x + 1$

(41)

5	1	3	-4
		5	40
	1	8	36

quotient = $x + 8$; Remainder = 36

(43)

-3	1	-2	5	4
		-3	15	-60
	1	-5	20	-56

quotient = $x^2 - 5x + 20$ Remainder = -56

(45)

3	5	−2	0	4
		15	39	117
	5	13	39	121

quotient = $5x^2 + 13x + 39$ Remainder = 121

(47) Remainder when divided by $x - c = P(c)$.

divisor	Remainder
$x-3$	$P(3) = 36$
$x-\frac{1}{2}$	$P(1/2) = -4$
$x+1$	$P(-1) = -16$
$x+2$	$P(-2) = -44$

$\therefore P(x) = 2x^3 - 3x^2 + 5x - 6$

(49) Polynomial $P(x) = 2x^3 - 9x^2 + 3$

$\therefore$ Remainder when divided by $(x-3) = P(3)$

$\therefore$ Remainder $= P(3) = 2(3)^3 - 9(3)^2 + 3 = -24$

Similarly

divisor	Remainder
$x-3$	$R = P(3) = -24$
$x-\frac{1}{2}$	$R = P(\frac{1}{2}) = 1$
$x+1$	$R = P(-1) = -8$
$x+2$	$R = P(-2) = -49$

Answer

(51) using Synthalic division.

−3	1	6	11	6
		−3	−9	−6
	1	3	2	0

$\therefore$ $x^3 + 6x^2 + 11x + 6 = (x+3)(x^2 + 3x + 2)$ Answer

(53) using Synthalic divison

−3	1	5	−2	−24
		−3	−6	24
	1	2	−8	0

$\therefore$ $x^3 + 5x^2 - 2x - 24 = (x+3)(x^2 + 2x - 8)$ Answer

(55) $\because P(x) = x^2 - 5x + 6$

$P(-2) = (-2)^2 - 5(-2) + 6 = 4 + 10 + 6 = 20$

$\therefore$ $P(-2) = 20 =$ Remainder in Problem 21 Answer