Answer key

The method: Synthetic division

To divide by $x - c$, use c. Bring down the first number, multiply by c, add, and repeat. Write 0 for a missing term. The last number is the remainder.

$(3x^3 - 15x^2 + 19x - 3) \div (x - 3) = 3x^2 - 6x + 1$

3	3	−15	19	−3
		9	−18	3
	3	−6	1	0

use 3; bring down, multiply by 3, add

quotient $3x^2 - 6x + 1$, remainder 0 — the bottom row, one degree lower

$(x^3 - x^2 - 18x + 11) \div (x + 4) = x^2 - 5x + 2$ R 3

−4	1	−1	−18	11
		−4	20	−8
	1	−5	2	3

use −4; bring down, multiply by −4, add

quotient $x^2 - 5x + 2$, remainder 3 — the bottom row, one degree lower

Problems 1 and 2 worked out · Version 0A

$(2x^3 - 5x^2 - 17x + 20) \div (x - 4) = 2x^2 + 3x - 5$

4	2	−5	−17	20
		8	12	−20
	2	3	−5	0

use 4; bring down, multiply by 4, add

quotient $2x^2 + 3x - 5$, remainder 0 — the bottom row, one degree lower

$(2x^2 - 3x - 20) \div (x - 4) = 2x + 5$

4	2	−3	−20
		8	20
	2	5	0

use 4; bring down, multiply by 4, add

quotient $2x + 5$, remainder 0 — the bottom row, one degree lower

Synthetic division · Version 0A

1) $2x^2 + 3x - 5$ 2) $2x + 5$ 3) $x^2 + 6x + 4$
4) $4x^2 + 2x + 2$ R −5 5) $2x + 5$ 6) $4x + 2$ R 7
7) $2x^2 - 5x - 5$ 8) $4x^2 + x - 5$ 9) $2x^2 + 6x - 4$
10) $4x^2 + 4x - 2$ R −11 11) $4x^2 + 5x + 3$ R −5
12) $x^2 - 2x - 1$ 13) $2x - 6$ R 10
14) $2x^2 - 3x + 1$ R −12 15) $x + 2$ R −12
16) $x^2 + 5$ 17) $x + 3$ R 12 18) $2x^2 + 3x$