Answer key

The method: Factoring with a leading coefficient

For $ax^2 + bx + c$, find two numbers that multiply to $a \times c$ and add to b. Split the middle term and group.

$3x^2 + 8x + 5 = (3x + 5)(x + 1)$

$a \times c = 3 \times 5 = 15$; multiply to 15, add to 8: 3 and 5

$3x^2 + 8x + 5 = 3x^2 + 3x + 5x + 5 = 3x(x + 1) + 5(x + 1) =$

$(3x + 5)(x + 1)$ split the middle, then group

Problems 1 and 2 worked out · Version 0A

$2x^2 + 5x + 3 = (2x + 3)(x + 1)$

$a \times c = 2 \times 3 = 6$; multiply to 6, add to 5: 2 and 3

$2x^2 + 5x + 3 = 2x^2 + 2x + 3x + 3 = 2x(x + 1) + 3(x + 1) =$

$(2x + 3)(x + 1)$ split the middle, then group

$3x^2 + 7x - 6 = (3x - 2)(x + 3)$

$a \times c = 3 \times (-6) = -18$; multiply to −18, add to 7: 9 and −2

$3x^2 + 7x - 6 = 3x^2 + 9x - 2x - 6 = 3x(x + 3) - 2(x + 3) =$

$(3x - 2)(x + 3)$ split the middle, then group

Factoring with a leading coefficient · Version 0A

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