

⑥ $x^2 + 9x + 18$
 $\frac{18}{1 \ 18 \ 19 \ (x+3)(x+6)}$
 $-1 \ -18 \ -19$ checks
 $2 \ 9 \ 11 \ x^2 + 6x + 3x + 18$
 $-2 \ -9 \ -11$
 $3 \ 6 \ 9$ $(x+3)(x+6)$
 $-3 \ -6 \ -9$

$x^2 - 5x + 4$
 $\frac{4}{1 \ 4 \ 5 \ (x-4)(x-1)}$
 $-1 \ -4 \ -5$ checks
 $2 \ 2 \ 4 \ x^2 - x - 4x + 4$
 $-2 \ -2 \ -4$
 $(x-4)(x-1)$

$x^2 + 8x + 15$
 $\frac{15}{1 \ 15 \ 16 \ (x+3)(x+5)}$
 $-1 \ -15 \ -16$ checks
 $3 \ 5 \ 8$
 $-3 \ -5 \ -8 \ x^2 + 5x + 3x + 15$
 $(x+3)(x+5)$

$x^2 + 6x - 7$
 $\frac{-7}{1 \ -7 \ -6 \ (x-1)(x+7)}$
 $-1 \ 7 \ 6$
 $(x-1)(x+7)$ checks
 $(x-1)(x+7)$

⑦ $x^2 + 7x + 10$
 $2 \cdot 5 = 10$
 and $2 + 5 = 7$
 $(x+2)(x+5)$
 check $x^2 + 5x + 2x + 10$
 $(x+2)(x+5)$

$x^2 + 10x - 11$
 $-1 \cdot 11 = -11 \quad -1 + 11 = 10$
 $(x-1)(x+11)$
 check $x^2 - 11x - x - 11$
 $(x-1)(x+11)$

$x^2 + 9x + 14$
 $2 \cdot 7 = 14, \quad 2 + 7 = 9$
 $(x+2)(x+7)$
 check $x^2 + 7x + 2x + 14$
 $(x+2)(x+7)$

$x^2 + 8x + 12$
 $6 \cdot 2 = 12 \quad 6 + 2 = 8$
 $(x+6)(x+2)$
 ALWAYS check!
 $(x+6)(x+2)$

I won't show the check on the next sets. You should check ALWAYS!

⑧ $x^2 - 4x - 12$
 $-6 \cdot 2 = -12 \quad -6 + 2 = -4$
 $(x-6)(x+2)$

$x^2 + 26x + 25$
 $25 \cdot 1 = 25 \quad 25 + 1 = 26$
 $(x+25)(x+1)$

$x^2 - 12x + 32$
 $-4(-8) = 32 \quad -4 + (-8) = -12$
 $(x-4)(x-8)$

$x^2 - 9x + 20$
 $-4(-5) = 20 \quad -4 + (-5) = -9$
 $(x-4)(x-5)$

⑨ $5x^2 - 5x - 30$
 $5(x^2 - x - 6)$
 $-3 \cdot 2 = 6 \quad -3 + 2 = -1$
 $5(x-3)(x+2)$

$8x^2 - 40x + 32$
 $8(x^2 - 5x + 4)$
 $-4 \cdot (-1) = 4 \quad -4 + (-1) = -5$
 $8(x-4)(x-1)$

$7x^2 + 63x + 126$
 $7(x^2 + 9x + 18)$
 $6 \cdot 3 = 18 \quad 6 + 3 = 9$
 $7(x+6)(x+3)$

$10x^2 - 20x - 80$
 $10(x^2 - 2x - 8)$
 $-4 \cdot 2 = -8 \quad -4 + 2 = -2$
 $10(x-4)(x+2)$

⑩ $3x^2 + 30x + 75$
 $3(x^2 + 10x + 25)$
 pattern $(a+b)(a+b)$
 $3(x+5)(x+5)$

$5x^2 - 180$
 $5(x^2 - 36)$
 pattern $(a-b)(a+b)$
 $5(x-6)(x+6)$

$2x^2 - 20x + 50$
 $2(x^2 - 10x + 25)$
 pattern $(x-5)^2$
 $2(x-5)(x-5)$

$3x^2 + 30x + 48$
 $3(x^2 + 10x + 16)$
 $2 \cdot 8 = 16, \quad 2 + 8 = 10$
 $3(x+2)(x+8)$

⑪ $12x^2 - 84x + 144$
 $12(x^2 - 7x + 12)$
 $-3(-4) = 12 \quad -3 + (-4) = -7$
 $12(x-3)(x-4)$

$2yx^2 - 12yx + 10y$
 $2y(x^2 - 6x + 5)$
 $-5(-1) = 5 \quad -5 + (-1) = -6$
 $2y(x-5)(x-1)$

$yx^2 + 2yx + y$
 $y(x^2 + 2x + 1)$
 pattern $(a+b)^2$
 $y(x+1)(x+1)$

$7x^2 + 56x + 105$
 $7(x^2 + 8x + 15)$
 $3 \cdot 5 = 15 \quad 3 + 5 = 8$
 $7(x+3)(x+5)$

⑫ $x^3 - 5x^2 - 14x$
 $x(x^2 - 5x - 14)$
 $-7(2) = -14 \quad -7 + 2 = -5$
 $x(x-7)(x+2)$

$x^3 + 11x^2 + 19x$
 $x(x^2 + 11x + 18)$
 $2 \cdot 9 = 18 \quad 2 + 9 = 11$
 $x(x+2)(x+9)$

$5yx^2 - 50yx - 280$
 $5y^2(x^2 - 10x - 56)$
 $-14 \cdot 4 = -56 \quad -14 + 4 = -10$
 $5y^2(x-14)(x+4)$

$yx^2 - yx + 12y$
 $y(x^2 - x + 12)$
 $y(x^2 - x + 12)$
 no other factoring is possible