Factoring Trinomials with a leading coefficient greater than 1.

Ex 1) $2x^2 + 7x - 15$ GCF = 1

-30

$2x^2 - 3x + 10x - 15$

$x(2x-3) + 5(2x-3)$

$(2x-3)(x+5)$

factors of -30	sum of factors
-2×15	$-2+15 = 13$
-3×10	$-3+10 = 7$ ✓

Ex 2) $6x^2 - 13x - 5$ GCF = 1

-30

$6x^2 + 2x - 15x - 5$

$2x(3x+1) - 5(3x+1)$

$(3x+1)(2x-5)$

factors of -30	sum of factors
-2×15	$-2+15 = 13$
2×-15	$2+(-15) = -13$ ✓

Ex 3) $6x^2 - 5x + 1$ GCF = 1

$6x^2 - 2x - 3x + 1$

$2x(3x-1) - 1(3x-1)$

$(2x-1)(3x-1)$

factors of 6	sum of factors
1×6	$1+6 = 7$
2×3	$2+3 = 5$
-2×-3	$-2+(-3) = -5$ ✓

Ex 4) $4x^2 + 4x + 1$ GCF = 1

$4x^2 + 2x + 2x + 1$

$2x(2x+1) + 1(2x+1)$

$(2x+1)(2x+1)$ Perfect Square Trinomial

$(2x+1)^2$

factors of 4	sum of factors
2×2	$2+2 = 4$

Ex 5) $18x^2 - 12x + 4$ GCF = 2

$2(9x^2 - 6x + 2)$ (18)

Doesn't factor.

factors of 18	sum of factors.
3 x 6	3+6 = 9
-3 x -6	-3+-6 = -9
1 x 18	1+18 = 19
-1 x -18	-1+-18 = -19
2 x 9	2+9 = 11
-2 x -9	-2+-9 = -11

Ex 6) $2(x+4)^2 - 11(x+4) + 15$ Let $b = x+4$

$2b^2 - 11b + 15$ (30) GCF = 1

$2b^2 - 6b - 5b + 15$

$2b(b-3) - 5(b-3)$

$(b-3)(2b-5)$

factors of 30	sum of factors -11
2 x 15	
-2 x -15	
3 x 10	
-3 x -10	
1 x 30	
-6 x 5	-6+-5 = -11

Ex 7) $(x^2-6)^2 + 7(x^2-6) - 30$ $b = x^2 - 6$

$b^2 + 7b - 30$

$b^2 + 10b - 3b - 30$

$b(b+10) - 3(b+10)$

$(b+10)(b-3)$

Substitute $b = x^2 - 6$

$(x^2-6+10)(x^2-6-3)$

$(x^2+4)(x^2-9)$ → Can this factor further?

$(x^2+4)(x+3)(x-3)$

factors of -30	sum of factors
-10 x 3	-10+3 = -7
10 x -3	10+(-3) = 7 ✓

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Assignment

a) $x^2 - 2x - 3$

b) $3x^2 + 5x - 2$

c) $x^2 + 5x + 4$

d) $2x^2 + 7x - 15$

e) $6x^2 + x - 2$

f) $5x^2 + 5x - 60$

g) $2x^2 - 72$

h) $\frac{1}{4}x^2 - \frac{1}{49}y^2$

i) $0.81x^2 - 0.25$

j) $4(x+3)^2 + 8(x+3) - 5$

k) $9(x-1)^2 - 100(x+1)^2$

l) $(2x-1)^2 + 16(2x-1) + 63$