$x(7x-4)$

$7x^2-4x$

$(5a+2)(a+4)$

$5a^2+20a+2a+8$

$5a^2+22a+8$

$(x+5)(x+7)$

$x^2+7x+5x+35$

$x^2+12x+35$

$(3b-4)(b+2)$

$3b^2+6b-4b-8$

$3b^2+2b-8$

$x^2-4x-12$

$(x-6)(x+2)$

$W=(x-6)$

$(5x-6)^2$

$(5x-6)(5x-6)$

$25x^2-30x-30x+36$

$25x^2-60x+36$

$4x^2 + 20x - 16$

$4(x^2 + 5x - 4)$

$\boxed{w = x^2 + 5x - 4}$

$(2 + 7x)(2 - 7x)$

$4 - \cancel{14x + 14x} - 49x^2$

$\boxed{-49x^2 + 4}$

$25 + 70x + 49x^2$

$49x^2 + 70x + 25$

$-3x^2 + 6x + 9$

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

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

$3x^2 + 6x + 4x + 8$

$(3x^2 + 6x) + (4x + 8)$

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

$\boxed{(x+2)(3x+4)}$

$2x^2 + 8x + 3x + 12$

$(2x^2 + 8x) + (3x + 12)$

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

$\boxed{(x+4)(2x+3)}$

$9x^2 + 6x + 12x + 8$

$(9x^2 + 6x) + (12x + 8)$

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

$\boxed{(3x+2)(3x+4)}$

$5x^2 + 10x + 2x + 4$

$(5x^2 + 10x) + (2x + 4)$

$5x(x + 2) + 2(x + 2)$

$\boxed{(x+2)(5x+2)}$

$8x^2 + 6x + 4x + 3$

$(8x^2 + 6x) + (4x + 3)$

$2x(4x + 3) + 1(4x + 3)$

$\boxed{(4x+3)(2x+1)}$

$2x^2 - 3x - 4x + 6$

$2x^2 - 4x - 3x + 6$

$(2x^2 - 4x) + (-3x + 6)$

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

$\boxed{(x-2)(2x-3)}$

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

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

$3x(x + 1) - 10(x + 1)$

$\boxed{(3x-10)(x+1)}$

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

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

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

$\boxed{(3x-1)(x+2)}$

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

$(2x^3 + 10x^2) + (3x + 15)$

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

$\boxed{(2x^2+3)(x+5)}$

$3x^2 + 10x + 8$

$3x^2 + 6x + 4x + 8$

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

$\boxed{(3x+4)(x+2)}$

$4x^2 + 16x + 15$

$a \cdot b = 4 \cdot 15 = 60$

$a + b = 16$

$(4x^2 + 6x) + (10x + 15)$

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

$\boxed{(2x+5)(2x+3)}$

$2x^2 - 3x - 9$

$a \cdot b = -18$

$a + b = -3$

$-6 \cdot 3 = -18$

$-6 + 3 = -3$

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

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

$\boxed{(2x+3)(x-3)}$

$3x^2 - 2x - 5$

$a \cdot b = 3 \cdot -5 = -15$

$a + b = -2$

$-5 \cdot 3 = -15$

$-5 + 3 = -2$

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

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

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

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

$6x^2 - 13x + 6$

$a \cdot b = 6 \cdot 6 = 36$

$a + b = -13$

$-9 \cdot -4 = -36$

$-9 - 4 = -13$

$6x^2 - 9x - 4x + 6$

$(6x^2 - 9x) + (-4x + 6)$

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

$\boxed{(3x - 2)(2x - 3)}$

$2x^2 + 7x + 3$

$a \cdot b = 2 \cdot 3 = 6$

$a + b = 7$

$6 \cdot 1 = 6$

$6 + 1 = 7$

$2x^2 + 6x + x + 3$

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

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

$\boxed{(2x + 1)(x + 3)}$

$-3x^2+17x-20$

$a\cdot b=-3\cdot -20=60$

$a+b=17$

$12\cdot 5=60$

$12+5=17$

$-3x^2+12x+5x-20$

$(-3x^2+12x)+(5x-20)$

$-3x(x-4)+5(x-4)$

$\boxed{(-3x+5)(x-4)}$

$-8x^2-15x+2$

$a\cdot b=-8\cdot 2=-16$

$a+b=-15$

$-16\cdot 1=-16$

$-16+1=-15$

$-8x^2-16x+x+2$

$(-8x^2-16x)+(x+2)$

$-8x(x+2)+1(x+2)$

$\boxed{(-8x+1)(x+2)}$

$6x^2-13x+6$

$a\cdot b=6\cdot 6=36$

$a+b=-13$

$-9\cdot -4=36$

$-9-4=-13$

$6x^2-9x-4x+6$

$(6x^2-9x)+(-4x+6)$

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

$\boxed{(3x-2)(2x-3)}$

$a^2 - b^2 = (a+b)(a-b)$

$(x+2)(x-2) = x^2 \cancel{-2x+2x} - 4$

$x^2 - 4$

$x^2 - 16$

$(x+4)(x-4)$

$x^2 - 25$

$(x+5)(x-5)$

$4x^2 - 9 = (2x)^2 - (3)^2$

$= \boxed{(2x+3)(2x-3)}$

$36 - x^2$

$-x^2 + 36$

$x^2 - 36$

$(x+6)(x-6)$

$640 - 10x^2$

$10(64 - x^2)$

$10(8+x)(8-x)$

$4x^2 - 1$

$\boxed{(2x+1)(2x-1)}$

$4x^2 \cancel{-2x+2x} - 1$

$4x^2 - 1$

$3x^2 - 147$

$3(x^2 - 49)$

$\boxed{3(x+7)(x-7)}$

$25x^2 - 16$

$\boxed{(5x+4)(5x-4)}$

$25x^2 \cancel{-20x+20x} - 16$

$25x^2 - 16$

$x^2 + 8x + 16$

$x^2 = (x)^2$ $16 = (4)^2$ 8

$2(x)(4) = 8x$

First and last both perfect squares

two times the product of the numbers that are squared

Both conditions met, means that this is a perfect square trinomial.

$x^2 + 8x + 16 =$

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

$= \boxed{(x+4)^2}$

$(x+4)^2 = (x+4)(x+4)$

$x^2 + 4x + 4x + 16$

$x^2 + 8x + 16$

x^2+6x+9

$(x+3)^2$

x^2-6x+9

$(x-3)(x-3)^2$ or $(x-3)^2$

$x^2+14x+49$

$(x+7)^2$

$4x^2+12x+9$

$4x^2=(2x)^2$ and $9=(3)^2$

$2(2x)(3)=12x$ = middle term

$a^2+2ab+b^2=(a+b)^2$

$4x^2+12x+9=(2x)^2+2(2x)(3)+(3)^2$

$=(2x+3)^2$

$9x^2+30x+25$

$9x^2=(3x)^2$

$25=(5)^2$

$30x=2(3x)(5)$

$(3x+5)^2$

$4x^2-20x+25$

$4x^2=(2x)=a$

$25=(-5)^2=b$

$-20=(2)(2x)(-5)$

$a=2x, b=-5$ $(2x-5)^2$

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

$x^4 = (x^2)^2$

$1 = (1)^2$

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

$a = x^2, b = 1$

$\boxed{(x^2+1)^2}$

$9x^2 + 24xy + 16y^2$

$9x^2 = (3x)^2$

$16y^2 = (4y)^2$

$24xy = 2(3x)(4y)$

$a = 3x, b = 4y$

$\boxed{(3x+4y)^2}$

$(3x+4y)(3x+4y)$

$9x^2 + 12xy$

$+12xy$

$+16y^2$

$9x^2 + 24xy + 16y^2$

$x^2 + 10x + 25$

$x^2 = (x)^2$

$25 = (5)^2$

$10 = 2(x)(5)$

$a = x, b = 5$

$\boxed{(x+5)^2}$

$81 + 18x + x^2$

$81 = (9)^2$

$x^2 = (x)^2$

$18 = 2(9)(x)$

$a = 9, b = x$

$\boxed{(9+x)^2}$

$x^2 + 4x + 4$

$x^2 = (x)^2$

$4 = (2)^2$

$4x = 2(x)(2)$

$a = x, b = 2$

$\boxed{(x+2)^2}$

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

$x^2 + 2x + 2x + 4 =$

$x^2 + 6x + 9$

$x^2 = (x)^2$

$9 = (3)^2$

$6x = 2(x)(3)$

$a = x, b = 3$

$\boxed{(x+3)^2}$

$25x^2 + 20x + 4$

$25x^2 = (5x)^2$

$4 = (2)^2$

$20x = 2(5x)(2)$

$(x+d)^2 = (x+d)(x+d)$

$x^2 + xd + xd + d^2$

$x^2 + 2xd + d^2$

$x^2 + 5x + c = (x+d)^2$

$= x^2 + 2dx + d^2$

$2d = 5$

$d = \boxed{\frac{5}{2}}$

$c = d^2$

$c = \left(\frac{5}{2}\right)^2 = \boxed{\frac{25}{4}}$

$4x^2 + 12x + 9$

$4x^2 = (2x)^2$

$9 = (3)^2$

$12x = 2(2x)(3)$

$(2x+3)^2$

$4x^2 - 9$

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

$\boxed{(2x+3)}$

$128 - 32x + 2x^2$

$2(64 - 16x + x^2)$

$64 = (-8)^2$

$x^2 = (x)^2$

$16x = 2(-8)(x)$

$(-8+x)^2$

$\boxed{2(-8+x)^2}$

$48 - 24 + 3x^2$

$3(16 - 8 + x^2)$

$16 = (-4)^2$

$x^2 = (x)^2$

$-8 = 2(-4)(x)$

$\boxed{3(-4+x)^2}$

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

$16 - 4x - 4x + x^2$

$3(16 - 8x + x^2)$

$48 - 24x + 3x^2$

$9x^2+6x+1$

$9x^2=(3x)^2$

$1=(1)^2$

$6=2(3x)(1)$

$a=3x,\ b=1$

$\boxed{(3x+1)^2}$

$(3x+1)(3x+1)$

$9x^2+3x+3x+1$

$9x^2+6x+1$

$2x^2-40x+200$

$2(x^2-20x+100)$

$x^2=(x)^2$

$100=(-10)^2$

$-20x=2(x)(-10)$

$a=x,\ b=-10$

$\boxed{2(x-10)^2}$

$2(x-10)(x-10)$

$2(x^2-10x-10x+100)$

$2(x^2-20x+100)$

$2x^2-40x+200$

$100 - 140x + 49x^2$

$100 = (10)^2$

$49x^2 = (-7x)^2$

$-140 = 2(10)(-7x)$

$a = 10, b = -7x$

$\boxed{(10 - 7x)^2}$

$(10-7x)(10-7x)$

$100 - 70x - 70x + 49x^2$

$100 - 140x + 49x^2$

$(10-7x)(10-7x)$

$100 - 70x - 70x + 49x^2$

$100 - 140x + 49x^2$

$100 - 140x + 49x^2$

$100 = (10)^2$

$49x^2 = (-7x)^2$

$-140 = 2(10)(-7x)$

$a = 10, b = -7x$

$\boxed{(10 - 7x)^2}$

$3x^2 - 20x - 7$

$a \cdot b = 3 \cdot -7 = -21$

$a + b = -20$

$-21 \cdot 1 = -21$

$-21 + 1 = -20$

$3x^2 - 21x + x - 7$

$(3x^2 - 21x) + (x - 7)$

$3x(x - 7) + 1(x - 7)$

$\boxed{(3x + 1)(x - 7)}$

$(3x + 1)(x - 7)$

$3x^2 - 21x + x - 7$

$3x^2 - 20x - 7$

$25x^2 - 16$

$\boxed{(5x + 4)(5x - 4)}$

$(5x + 4)(5x - 4)$

$25x^2 - \cancel{20x + 20x} - 16$

$25x^2 - 16$

$2x^2 - 13x + 20$

$a \cdot b = 2 \cdot 20 = 40$

$a + b = -13$

$-8 \cdot -5 = 40$

$-8 - 5 = -13$

$2x^2 - 8x - 5x + 20$

$(2x^2 - 8x) + (-5x + 20)$

$2x(x-4) - 5(x-4)$

$\boxed{(2x-5)(x-4)}$

$(2x-5)(x-4)$

$2x^2 - 8x - 5x + 20$

$2x^2 - 13x + 20$

$64x^2 - 144x + 81$

$64x^2 = (-8x)^2$

$81 = (9)^2$

$-144 = 2(8x)(-9)$

$a = 8x, \; b = -9$

$\boxed{(8x-9)^2}$

$(8x-9)(8x-9)$

$64x^2 - 72x - 72x + 81$

$64x^2 - 144x + 81$

$6x^2 + 3x$

$\boxed{3x(2x+1)}$

$4x^2 - 4x - 48$

$4(x^2 - x - 12)$

$\boxed{4(x-4)(x+3)}$

$3x^2 + 30x + 75$

$3(x^2 + 10x + 25)$

$x^2 = (x)^2$

$25 = (5)^2$

$10x = 2(x)(5)$

$a = x, b = 5$

$\boxed{3(x+5)^2}$

$7x^2 - 63$

$7(x^2 - 9)$

$7(x+3)(x-3)$

$2x^2 + 7x + 3$

$a \cdot b = 2 \cdot 3 = 6$

$a + b = 7$

$6 \cdot 1 = 6$

$6 + 1 = 7$

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

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

$\boxed{(2x+1)(x+3)}$

$2x^2 + 4x - 16$

$2(x^2 + 2x - 8)$

$\boxed{2(x+4)(x-2)}$

$3x^2 - 60x + 300$

$3(x^2 - 20x + 100)$

$x^2 = (x)^2$

$100 = (-10)^2$

$-20x = 2(x)(-10)$

$a = x, b = -10$

$\boxed{3(x-10)^2}$

$3(x-10)(x-10)$

$3x^2 - 60x + 300$

$3(x^2 - 20x + 100)$

$x^2 = (x)^2$

$100 = (-10)^2$

$-20x = 2(x)(-10)$

$a = x, b = -10$

$\boxed{3(x-10)^2}$

$72x^2 - 2$

$2(36x^2 - 1)$

$\boxed{2(6x-1)(6x+1)}$

$36x^2 + 6x - 6x - 1$

$2(36x^2 - 1)$

$72x^2 - 2$

$5x^2 + 5x + 15$

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

$56 - 18x + x^2$

$a \cdot b = 56$

$a + b = -18$

$-14 \cdot -4 = 56$

$-14 - 4 = -18$

$56 - 14x - 4x + x^2$

$(56 - 14x) + (-4x + x^2)$

$14(4 - x) - x(4 - x)$

$(14 - x)(4 - x)$

$8x^2 - 12x - 8$

$a \cdot b = 8 \cdot -8 = -64$

$a + b = -12$

$-16 \cdot 4 = -64$

$-16 + 4 = -12$

$8x^2 - 16x + 4x - 8$

$8x(x - 2) + 4(x - 2)$

$(8x + 4)(x - 2)$

$4(2x + 1)(x - 2)$

$3x^2 + 27$

$3(x^2 + 9)$

$(6x+1)(1-3x)$

$6x - 18x^2 + 1 - 3x$

$\boxed{-18x^2 + 3x + 1}$

$128 - 32x + 2x^2$

$2(64 - 16x + x^2)$

$x^2 = (x)^2$

$64 = (-8)^2$

$-16x = 2(x)(-8)$

$a = -8, b = x$

$\boxed{2(-8+x)^2}$

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

$\boxed{10x^2 - 4x + 6}$

$640 - 10x^2$

$10(64 - x^2)$

$\boxed{10(8+x)(8-x)}$

$64 + \cancel{8x} - \cancel{8x} - x^2$

$10(64 - x^2)$

$640 - 10x^2$

$5x^2 + 25x + 20$

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

$\boxed{5(x+4)(x+1)}$

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

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

$8x^2 - 18x - 5$

$a \cdot b = 8 \cdot -5 = -40$

$a + b = -18$

$-20 \cdot 2 = -40$

$-20 + 2 = -18$

$(8x^2 + 2x) + (-20x - 5)$

$2x(4x + 1) - 5(4x + 1)$

$\boxed{(2x - 5)(4x + 1)}$

$8x^2 + 2x - 20x - 5$

$8x^2 - 18x - 5$

$(2 + x)(2 - x)$

$4 - \cancel{2x + 2x} - x^2$

$\boxed{4 - x^2}$

$(2x + 3)^2$

$(2x + 3)(2x + 3)$

$4x^2 + 6x + 6x + 9$

$\boxed{4x^2 + 12x + 9}$

$(x + 5)(x + 4)$

$x^2 + 4x + 5x + 20$

$\boxed{x^2 + 9x + 20}$

$10x^2 + 50x$

$$\boxed{10x(x+5)}$$