

October 16, 2001

Binomials

Expand & Simplify.

$$\begin{aligned} 1) & (3x-4)(2x+1) \\ & = 6x^2 + 3x - 8x - 4 \\ & = 6x^2 - 5x - 4 \end{aligned}$$

$$2) 5(2x-3)(4x-4)$$

METHOD #1

$$\begin{aligned} & 5(2x-3)(4x-4) \\ & = 5(8x^2 - 8x - 12x + 12) \\ & = 5(8x^2 - 20x + 12) \\ & = 40x^2 - 100x + 60 \end{aligned}$$

METHOD #2

$$\begin{aligned} & 5(2x-3)(4x-4) \\ & = (10x-15)(4x-4) \\ & = 40x^2 - 40x - 60x + 60 \\ & = 40x^2 - 100x + 60 \end{aligned}$$

$$\begin{aligned} 3) & (6x-2)(4x+5) - (2x+1)(3x-6) \\ & = (24x^2 + 30x - 8x - 10) - (6x^2 - 12x + 3x - 6) \\ & = (24x^2 + 22x - 10) - (6x^2 - 9x - 6) \\ & = 24x^2 + 22x - 10 - 6x^2 + 9x + 6 \\ & = 18x^2 + 31x - 4 \end{aligned}$$

Special Patterns

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

METHOD #1

$$\begin{aligned} & (6x-2)^2 \\ &= (6x-2)(6x-2) \\ &= 36x^2 - 12x - 12x + 4 \\ &= 36x^2 - 24x + 4 \end{aligned}$$

METHOD #2

$$\begin{aligned} & (6x-2)^2 \\ &= 36x^2 - 24x + 4 \\ & \quad \uparrow \\ & (1^{st})^2 + (\text{twice product}) + (2^{nd})^2 \end{aligned}$$

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

METHOD #1

$$\begin{aligned} & (5x+3)^2 \\ &= (5x+3)(5x+3) \\ &= 25x^2 + 15x + 15x + 9 \\ &= 25x^2 + 30x + 9 \end{aligned}$$

METHOD #2

$$\begin{aligned} & (5x+3)^2 \\ &= 25x^2 + 30x + 9 \end{aligned}$$

6) $(3x+2)(3x-2) \rightarrow$ Conjugates

METHOD #1

$$\begin{aligned} & (3x+2)(3x-2) \\ &= 9x^2 + 6x - 6x - 4 \end{aligned}$$

METHOD #2

$$\begin{aligned} & (3x+2)(3x-2) \\ &= 9x^2 - 4 \end{aligned}$$

7) Hard

$$\begin{aligned} & 3(2x+4)^2 - 5(6x-1)^2 \\ &= 3(4x^2 + 16x + 16) - 5(36x^2 - 12x + 1) \\ &= 12x^2 + 48x + 48 - 180x^2 + 60x - 5 \\ &= -168x^2 + 108x + 43 \end{aligned}$$