

Expanding Brackets

Expand and simplify

$$3(2x+5), \quad (7y-3)(-2), \quad (2x+3)(5-7x), \quad (2x-y)(3x-5y),$$

$$(3e^x - 2x^3 + 5)(6 - \ln(x)), \quad (t-3)(t+2)(2t+1), \quad (1+z)(z+2) + (3-z)(z+2),$$

$$(x+y)^2, \quad (2t-3)^2, \quad (x+y)^3, \quad (2p-5)^3$$

$$(x-y)(x+y), \quad (x-y)(x^2 + xy + y^2)$$

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$$3(2x+5) = \underline{2x+5} + \underline{2x+5} + \underline{2x+5} = \underline{6x} + \underline{15}$$

$$\begin{aligned} 3(2x+5) &= 3 \times 2x + 3 \times 5 \\ &= 6x + 15 \end{aligned}$$

$$\begin{aligned} (-7y-3)(-2) &= (-7y) \times (-2) + (-3) \times (-2) \\ &= -14y + 6 \end{aligned}$$

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$$\begin{aligned}
 (2x+3)(5-7x) &= 2x(5-7x) + 3(5-7x) = 2x \times 5 + (2x)(-7x) + 3 \times 5 + 3(-7x) \\
 &= 10x + -14x^2 + 15 + -21x \\
 &= -14x^2 - 11x + 15
 \end{aligned}$$

	2x	3
5	10x	15
-7x	-14x ²	-21x

$$(2x+3)(5-7x)$$

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$$(2x-y)(3x-5y) = 6x^2 - 10xy - 3xy + 5y^2 = 6x^2 - 13xy + 5y^2$$

	2x	-y
3x	6x ²	-3xy
-5y	-10xy	+5y ²

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$$(3e^x - 2x^3 + 5)(6 - \ln(x)) = 18e^x - 3e^x \ln(x) - 12x^3 + 2x^3 \ln(x) + 30 - 5 \ln(x)$$

	$3e^x$	$-2x^3$	5
6	$18e^x$	$-12x^3$	30
$-\ln(x)$	$-3e^x \ln(x)$	$+2x^3 \ln(x)$	$-5 \ln(x)$

$$(3e^x - 2x^3 + 5)(6 - \ln(x))$$

$$\begin{aligned} (t-3)(t+2)(2t+1) &= (t^2 + 2t - 3t - 6)(2t+1) = (t^2 - t - 6)(2t+1) \\ &= 2t^3 + t^2 - 2t^2 - t - 12t - 6 \\ &= 2t^3 - t^2 - 13t - 6 \end{aligned}$$

$$(t-3)(t+2)(2t+1) = \underline{2}t^3 + \underline{-1}t^2 + \underline{-13}t + \underline{-6}$$

$$t \times t \times 2t = 2t^3$$

$$t \times t \times 1 = t^2$$

$$t \times 2 \times 2t = 4t^2$$

$$-3 \times t \times 2t = -6t^2$$

$$t \times 2 \times 1 = 2t$$

$$-3 \times t \times 1 = -3t$$

$$-3 \times 2 \times 2t = -12t$$

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

$$\begin{aligned} \underline{(1+z)} \underline{(z+2)} + \underline{(3-z)} \underline{(z+2)} &= \left((1+z) + (3-z) \right) (z+2) \\ &= (4) \times (z+2) \\ &= \underline{\underline{4z+8}} \end{aligned}$$

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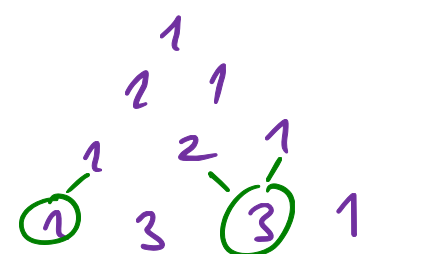
$$(x+y)^2 = (x+y)(x+y) = x^2 + xy + yx + y^2 = x^2 + 2xy + y^2$$

$$\begin{aligned} \left(\frac{2t}{x} - \frac{3}{y}\right)^2 &= (2t)^2 + 2(2t)(-3) + (-3)^2 \\ &= 4t^2 - 12t + 9 \end{aligned}$$

$$\begin{aligned} (x+y)^3 &= (x+y)(x+y)(x+y) = (x^2 + 2xy + y^2)(x+y) \\ &= x^3 + x^2y + 2x^2y + 2xy^2 + xy^2 + y^3 \\ &= x^3 + 3x^2y + 3xy^2 + y^3 \end{aligned}$$

$$\begin{aligned} \left(\frac{2p}{x} - \frac{5}{y}\right)^3 &= (2p)^3 + 3(2p)^2(-5) + 3(2p)(-5)^2 + (-5)^3 \\ &= 8p^3 - 60p^2 + 150 - 125 \end{aligned}$$

$$(x+y)^4 = x^4 + 4x^3y + 6x^2y^2 + 4xy^3 + y^4$$



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$$(x-y)(x+y) = x^2 + \cancel{xy} - \cancel{yx} - y^2 = x^2 - y^2$$

difference of
2 squares

$$4t^2 - 3 = (2t)^2 - (\sqrt{3})^2 \\ = (2t - \sqrt{3})(2t + \sqrt{3})$$

$$(x-y)(x^2 + xy + y^2) = x^3 + x^2y + xy^2 \\ - x^2y - xy^2 - y^3 \\ = x^3 - y^3$$

$$(x-y)(x^3 + x^2y + xy^2 + y^3) = x^4 - y^4$$