

Exponent Laws
Multiplication Law: $x^n \cdot x^m = x^{n+m}$

Ex. 1 $3^7 \cdot 3^2 \cdot 3^9 = 3^{7+2+9} = 3^{18}$

Ex. 2

x^3	y^4	x^3	y^4
$x \cdot x \cdot x$	$y \cdot y \cdot y \cdot y$	$x \cdot x \cdot x$	$y \cdot y \cdot y \cdot y$
$(3+4)$	$(1+3)$		
$= x^7 y^4$			

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Division Law $\frac{x^m}{x^n} = x^{m-n}$

Ex. $\frac{2^5}{2^2} = 2^{5-2} = 2^3$

OR $\frac{2^5}{2^2} = \frac{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}{2 \cdot 2} = 2^3$

Ex. 2 $\frac{x^5 y^9}{x^2 y} = x^3 y^8$

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Zero Law $x^0 = 1$

Ex. $243^0 = 1$

$12497^0 = 1$

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Power Law $(x^m)^n = x^{m \cdot n}$

Ex. 1 $(5^2)^3 = 5^{2 \cdot 3} = 5^6$

Ex. 2 $(2x^4)^3 = 2^3 \cdot x^{4 \cdot 3} = 8x^{12}$

Ex. 3 $(x^3 y^4 z)^2 = x^6 y^8 z^2$

Ex. 4 $-3^2 = -1 \cdot 3^2 = -1 \cdot 9 = -9$

$(-3)^2 = (-3) \cdot (-3) = 9$

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Difference of Squares

Factor $x^2 - 25 = (x+5)(x-5)$

$y^2 - 81 = (y-9)(y+9)$

$q^2 - 16 = (q-4)(q+4)$

$4q^2 - 16 = (2q-4)(2q+4)$

$16p^2 - 64 = (4p-8)(4p+8)$

$16p^2 - 64 = 16(p^2 - 4) = 16(p-2)(p+2)$

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Area of shaded area

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

Outside: $(x-1)(2x+7) = 2x^2 + 7x - 2x - 7 = 2x^2 + 5x - 7$

$(2x^2 + 5x - 7) - (x^2 + 4x)$

$= 2x^2 + 5x - 7 - x^2 - 4x$

$w_s = x^2 + x - 7$

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$$10n^2 - 42n - 108$$
$$2(5n^2 - 21n - 54)$$
$$270 \quad \begin{array}{l} 30 \times 9 = 270 \\ -30 + 9 = -21 \end{array}$$

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