10.4 Working with Powers

Base → 3^2 ← Exponent

What does a power represent

$4^5 = 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4$

$4^3 = 4 \cdot 4 \cdot 4$

$4^5 \cdot 4^3 = 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 = 4^8$

Product of Powers

$a^m \cdot a^n = a^{m+n}$

$4^5 \cdot 4^3 = 4^{5+3} = 4^8$

$c^5 \cdot c^3 \cdot c = c^{5+3+1} = c^9$

Power of a Power

$(a^m)^n = a^{m \cdot n}$

$(4^2)^3 = 4^2 \cdot 4^2 \cdot 4^2 = 4^6$

$= 4^{2 \cdot 3} = 4^6$

Power of Product

$(ab)^n = a^n b^n$

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

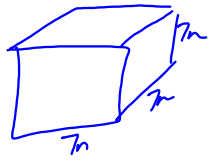
$(2a^4)(2a^2)^5$

$2a^4 \cdot 2^5 a^{10}$

$2 \cdot 2^5 a^4 \cdot a^{10}$

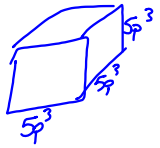
$2^6 a^{14}$

$64a^{14}$



$V = 7n \cdot 7n \cdot 7n$

$= 7^3 n^3 = 343n^3$



$V = (5p^3)^3$

$V = 5^3 p^9 = 125p^9$

$(2x^3y^2z^4)^3 = 8x^{3\cdot3}y^{2\cdot3}z^{4\cdot3}$

$2^3x^3y^2z^4$

$8x^3y^2z^4$