M9 - 3.2 - Multiply Laws Notes

Exponents to exponents to exponents, Multiply exponents

$(2^2)^3 = (2 \times 2)^3 = (2 \times 2) \times (2 \times 2) \times (2 \times 2) = \boxed{2^6}$

Check Answer!

$(2^2)^3 = 2^{2\times3} = \boxed{2^6}$ | Multiply Exponents | $(2^2)^3 = 64 = 2^6$ ✓

$(5^4)^2 = (5 \times 5 \times 5 \times 5)^2 = (5 \times 5 \times 5 \times 5) \times (5 \times 5 \times 5 \times 5) = \boxed{5^8}$

$(5^4)^2 = 5^{4\times2} = \boxed{5^8}$

When Product/Quotients to Exponents, Multiply Exponents

Down the Page (Multistep)

$(3 \times 4)^2 =$
$(3^1 \times 4^1)^2$
$\boxed{3^2 \times 4^2}$

Give it an Exponent of 1
Multiply Exponents

$3 = 3^1, 4 = 4^1$ | $(3^1 \times 4^1)^2$

×
$1 \times 2 = 2$
$1 \times 2 = 2$

$a^b \times c^b = (a \times c)^b$

OR

$(3 \times 4)^2 =$
$\boxed{12^2}$

Multiply Inside Brackets

BEDMAS | Cannot distribute into a sum!
$(3 + 4)^2 \neq 3^2 + 4^2 = 25$
$(3 + 4)^2 = (3 + 4)(3 + 4) = 7 \times 7 = 49$

$(3 \times 4)^2 = 144 = 12^2$ ✓ Check Answer!

$\dfrac{12^3}{3^3} =$
$\left(\dfrac{12}{3}\right)^3$
$(4)^3$
$\boxed{4^3}$

$\dfrac{a^b}{c^b} = \left(\dfrac{a}{c}\right)^b$ **OR**

Divide

$\dfrac{12^3}{3^3} =$
$\dfrac{(3^1 \times 4^1)^3}{3^3}$
$\dfrac{3^3 \times 4^3}{3^3}$
4^3

Product

Simplify

Check Answer
$\dfrac{12^3}{3^3} = \dfrac{1728}{27} = 64 = 4^3$ ✓

$\left(\dfrac{3}{5}\right)^2 =$
$\left(\dfrac{3^1}{5^1}\right)^2$
$\boxed{\dfrac{3^2}{5^2} = \dfrac{9}{25}}$

Give it an Exponent of 1
Multiply Exponents

×
$\left(\dfrac{3^1}{5^1}\right)^2$ | $1 \times 2 = 2$
$1 \times 2 = 2$

$\left(\dfrac{3}{5}\right)^2 =$
$(0.6)^2$
0.6×0.6
$\boxed{0.36}$

$\left(\dfrac{3}{5}\right)^2 = \dfrac{3^2}{5^2} = \dfrac{9}{25} = 0.36$ ✓ Check Answer!

Check Answer!
Arbitrary Numbers!
$x = 3$

$(2x)^3 = (2x) \times (2x) \times (2x) = \boxed{8x^3}$

$(2x)^3$ Write Question/Answer $8x^3$
$(2(3))^3$ Substitute Arbitrary # $8(3)^3$
6^3 Solve 8×27
216 Compare 216

$(2x)^3 =$
$(2^1 x^1)^3$
$2^3 x^3$
$\boxed{8x^3}$

Give it an Exponent of 1
Multiply Exponents

$216 = 216$ ✓