

# T7-1 Multiplication Properties of Exponents

$3^4$  ← Exponent  
3  
 base (factor)

$$\underbrace{3 \cdot 3 \cdot 3 \cdot 3}_{4 \text{ factors of } 3} = 81$$

Exponent Form	Base	Power
$4^5$	4	5
$(xy)^2$	$(xy)$	2
$3^1$	3	1
$y^x$	y	x
$(2x)^2$	2x	2
$(10xy)^{-6}$	10xy	-6

$$2x^2 = 2 \cdot x^2$$

$$(2x)^2 = 2x \cdot 2x$$

$$5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 = 5^6$$

$$m \cdot m \cdot m = m^3$$

$$\underbrace{6 \cdot 6 \cdot 7 \cdot 7 \cdot 7}_{6^2 \cdot 7^3}$$

Expand  $9x^5 = 9 \cdot x \cdot x \cdot x \cdot x \cdot x$

$$(4x)^2 = 4x \cdot 4x = 4 \cdot 4 \cdot x \cdot x$$

Your Turn:

$$x^5 y^3$$

$$12x^3$$

$$(4zx)^4$$

$$x^4 y^2$$

$$x^3 \cdot x^2 = x^{3+2} = x^5$$

must write this OR expand!

You try  $y^3 \cdot y^2 =$

$$x^2 x^3 x =$$

$$a^2 b^3 a^3 =$$

More Complicated: Regroup

$$\underline{2}x^5 \cdot \underline{3}x^6$$

$$\underbrace{2 \cdot 3} \cdot x^5 x^6$$

$$6 \cdot x^{5+6}$$

$$\boxed{6x^{11}}$$

You:

$$3b^2 \cdot 5b^3$$

$$4r^3 \cdot 2r^2$$

$$m^4 \cdot 2 \cdot m^3$$

$$(-2c^4d)(-4cd) \quad \text{Regroup!}$$

$$\underbrace{-2(-4)} \underbrace{c^4 c} \underbrace{d d}$$

$$8 \quad c^5 \quad d^2$$

$$(y^2z)(yz^2) = y^2 y z z^2 = y^3 z^3$$

$$6cd^3 \cdot 5c^4d^2$$

$$8r^2g^5 \cdot 3r^3g^2$$



Expand

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

↓  
Regroup

↓  
Simplify

$$(4c^3)^2 = 4c^3 4c^3 = \underbrace{4 \cdot 4}_{4^2} \cdot c^3 c^3$$

$$\boxed{16c^6}$$

YOU:

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

$$(r^{12})^5$$

$$(v^2 x^8)^8$$

$$(c^3 b^7)^3 = c^3 c^3 c^3 b^7 b^7 b^7 = ccc b^7 b^7 b^7$$

↑

$$\boxed{c^9 b^{21}}$$

Watch for loners - they fool you!