

## 8-3, 4 Multiplication Properties of Exponents

You can write the product of powers with the same base, like  $2^4 \cdot 2^2$ , using one exponent.

$$2^4 \cdot 2^2 =$$

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

In, general, when we multiply powers with the same base we \_\_\_\_\_

Let's Look at some Completed Examples

EX1:

Helpful Hints to Remember:

$$2n^5 \cdot 3n^{-2} = 6n^3$$

EX2:

$$(4c^4)(ac^3)(3a^5c) = 12a^6c^8$$

Try a Few:

1. $d^{-2}d^7 =$	2. $(7x^5)(8x) =$	3. $5t^{-2}2t^{-5} =$
4. $(9r^2s^{-5})(4rs) =$	5. $(x^5y^2)(x^{-6}y) =$	6. $-m^2 \cdot 4r^3 \cdot 3r^5 \cdot 5m =$

Take a look at these next examples. To simplify powers raised to another power, we simply write out the expression in expanded form and then multiply.

$$(5^4)^2 =$$

$$(a^2)^5 =$$

Let's Look at some Completed Examples

EX1:

Helpful Hints to Remember:

$$(3c^5)^3 = (3c^5)(3c^5)(3c^5) = 27c^{15}$$

Try a Few:

1. $(-5y^2)^3 =$	2. $x^2(2xy)^3 =$
3. $(a^{-2})^3 a^{-12} =$	4. $(3b^{-2})^2(a^2b^4)^3 =$

Mixed Review:

1. $(x^{-3}y)(3y^2) =$	2. $4d^4 \cdot 7d^2 \cdot a^0 =$	3. $(5c^{-4})(-4m^2c^8) =$
4. $(q^3r)^4 =$	5. $(c^{-3}d^0c^3)^2 =$	6. $(c^9)^{-3} =$
7. $ba^4 \cdot (2ba^4)^3 =$	8. $(x^2y)^2(-3xy)^3 =$	

**Simplify using positive exponents.**

1.  $(2x)(3x)$

2.  $(3x^2)^2(-2xy)$

3.  $(3a)^2$

4.  $b(3b)^3$

5.  $(2x^2y^3)(-4xy^{-4})$

6.  $(-3y)(7y^4z^{-2})$

7.  $(-8ab^3)(-5ab^{-3}c)$

8.  $3x(2x)^4$