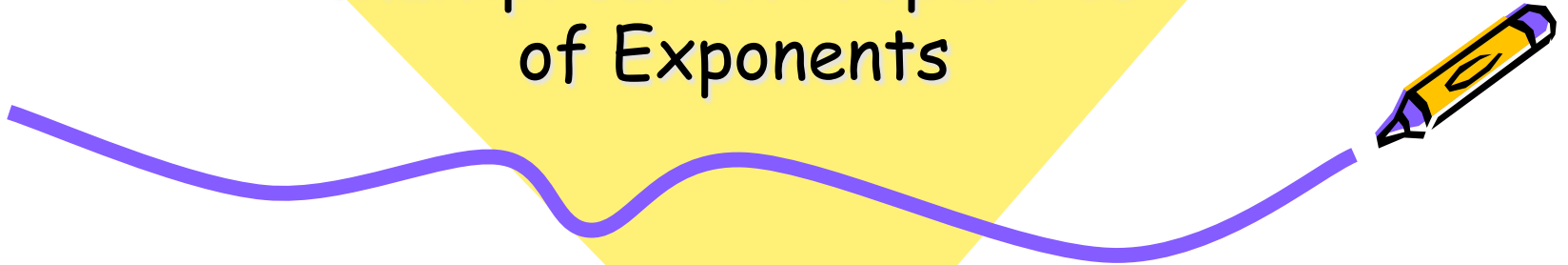




Ch 8.3

Multiplication Properties of Exponents



Multiplying Exponents

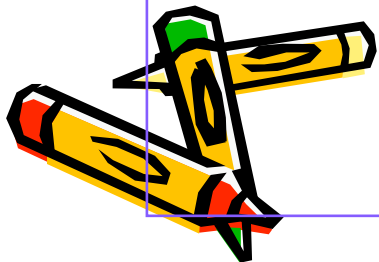
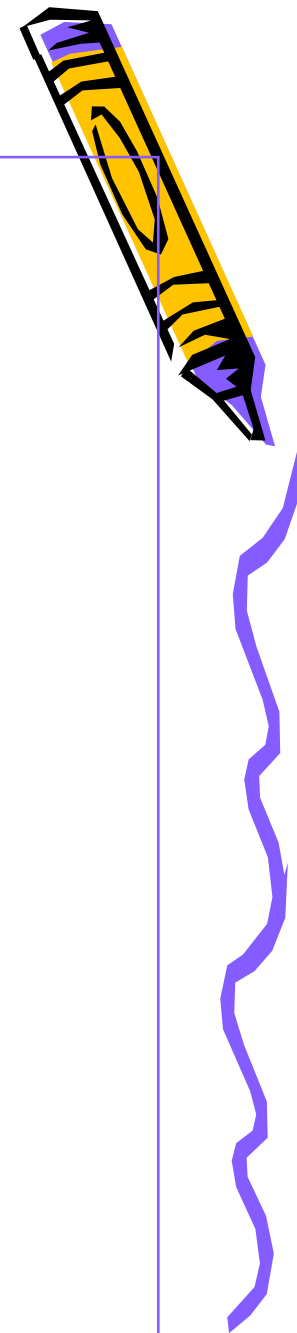
- For every non-zero # a & integers m & n , $a^m \cdot a^n = a^{m+n}$
- When you have same bases, **add the exponents together.**
- Rmbr: a^2 is $a \cdot a$ so $a^2 \cdot a^3$ is $a \cdot a \cdot a \cdot a \cdot a = a^5$

Examples:

$$1. x^2 \cdot x^3 \cdot x^5 = x^{2+3+5} = x^{10}$$

$$2. y \cdot y^4 = y^{1+4} = y^5$$

$$3. 2^4 \cdot 2^{-4} = 2^{4+(-4)} = 2^0 = 1$$



Try some

Write each expression using each base only once

1. $3^3 \cdot 3^2$

2. $7^{-3} \cdot 7^2 \cdot 7^6$

3. $4^{-2} \cdot 4$

4. $b^{-2} \cdot b^4 \cdot b^6$

5. $p^2 \cdot p \cdot p^5$

6. $x^5 \cdot x^{-2} \cdot x^{-3}$



Multiplying Powers in an Expression

- Multiply the coefficients together
- Add the exponents together of **same bases (matching)**

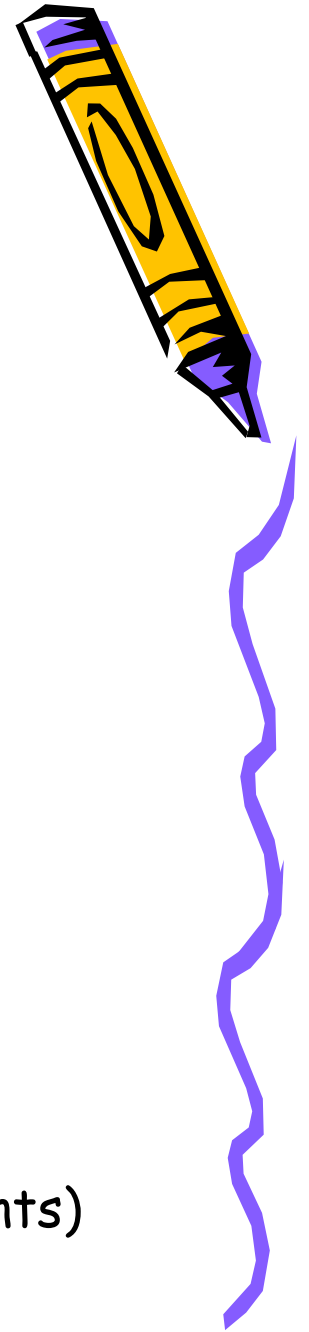
Examples:

$$1. \quad 2x^{-3} \cdot x^4 = 2x^{-3+4} = 2x$$

$$2. \quad 4x^6 \cdot 5x^{-4} = (4 \cdot 5)(x^{6+(-4)}) = 20x^2$$

$$3. \quad 2x^2y \cdot 7x^5y^8z^{-5} = (2 \cdot 7)(x^{2+5})(y^{1+8})(z^{-5}) =$$
$$\frac{14x^7y^9}{z^5}$$

*Make sure the expression is in simplest form
(each base only used once & only positive exponents)



Try Some

Simplify each expression

1. $a \cdot b \cdot a^5$

2. $8w^3 \cdot 2w^4$

3. $6y^2 \cdot 3y^3 \cdot 2y^{-4}$

4. $n^{-1} \cdot n^{-5}$

5. $5x^4y^{-5} \cdot 6x^{11}y$

