TOPIC: THE PRODUCT RULE

The Product Rule for Exponents

◆ Recall: An **exponent** represents *repeated multiplication*: $3^2 = 3 \cdot 3$

EXPONENT RULES			
Name	**Example**	**Rule**	**Description**
Product Rule	$4^2 \times 4^1 =$ $= 4^{\square} = 4^{\square\square\square}$	$a^m \times a^n = a^{m+n}$	*Multiply* terms w/ ***same base*** ⇒ **[ADD | SUBTRACT]** exp.

EXAMPLE Use the product rule to evaluate or simplify each exponential expression.

$(\boldsymbol{A})$ $(-3)^5 \cdot (-3)^2$

$(\boldsymbol{B})$ $x^{30} \cdot x^{70}$

TOPIC: THE PRODUCT RULE

PRACTICE Simplify each expression using the product rule if possible.

(A) $12^3 \cdot 12^9$

(B) $(-4)^6(-4)$

PRACTICE Simplify each expression.

(A) $xy \cdot 3x^2$

(B) $(-5a^2)(3a^8)$

(C) $(2s^3t)(3s^4t^2)$

EXAMPLE Find the area of a square with side length $5x^3$ centimeters.