

# Product and Power Rules of Exponents



## Overview of problems



Example Set: A

Simplify the expression

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

$$(2^5 \cdot 2^3)^4$$

$$x^4 \cdot x'$$

$$(y^2 x^3)^7$$

$$(y^2)^3$$

$$(2x)^3$$

$$(w^4 w)^2$$

$$(2^2 \cdot 2^3)^2$$



## Example Set: B

Simplify the expression

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

$$(abc)^3 \cdot -ab^2$$

$$[(-2xy)^2]^3$$

$$(-y)^4 (-y)^3 (-y)^2$$

$$(w^2xy^3)^2 (w^3x)^3$$

$$(4x^2)^3 \left(\frac{1}{2}x\right)^5$$



## Example Set: C

Evaluate the expression for the given values

$$x = -2 \quad y = 3 \quad z = 5$$

$$(3x^2y)^4$$

$$4(x^3y^2)^2 \cdot (-2xyz)^3$$

$$(x+z)^y \cdot (xz)^y$$

$$[(x^2z^3y) \cdot xyz]^2$$

# Product and Power Rules of Exponents



## Overview of problems- KEY



Example Set: A

Simplify the expression

$$3^2 \cdot 3^5 = 3^7$$

$$(2^5 \cdot 2^3)^4 = 2^{32}$$

$$x^4 \cdot x^1 = x^5$$

$$(y^2 x^3)^7 = y^{14} x^{21}$$

$$(y^2)^3 = y^6$$

$$(2x)^3 = 2^3 x^3$$

$$(w^4 w)^2 = w^{10}$$

$$(2^2 \cdot 2^3)^2 = 2^{10}$$



## Example Set: B

Simplify the expression

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

$$108x^8$$

$$(abc)^3 \cdot -ab^2$$

$$-a^4b^5c^3$$

$$[(-2xy)^2]^3$$

$$64x^6y^6$$

$$(-y)^4(-y)^3(-y)^2$$

$$-y^9$$

$$(w^2xy^3)^2(w^3x)^3$$

$$w^{13}x^5y^6$$

$$(4x^2)^3\left(\frac{1}{2}x\right)^5$$

$$2x^{11}$$



## Example Set: C

Evaluate the expression for the given values

$$x = -2 \quad y = 3 \quad z = 5$$

$$(3x^2y)^4 = 1679616$$

$$4(x^3y^2)^2 \cdot (-2xyz)^3 = 4478976000$$

$$(x+z)^y \cdot (xz)^y = -27000$$

$$[(x^2z^3y) \cdot xyz]^2 = 2025000000$$