

Exponent Investigation

Property #1

Step 1: Write each product in expanded form then write using one exponent

ex: $3^2 \cdot 3^4 = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 = 3^6$

a) $2^3 \cdot 2^4$ b) $x^5 \cdot x^{12}$ c) $10^2 \cdot 10^5$

Step 2: Generalize $a^m \cdot a^n = a^{m+n}$
same base (a)

Step 3: Practice

a) $x^7 \cdot x^9 = x^{16}$

b) $3^2 \cdot 3^9 = 3^{11}$
base: 3

c) $2x^4 \cdot 3x^5 = 6x^9$

d) $x^7 \cdot x^5 \cdot y^3 \cdot y^7 = x^{12} y^{10}$

property #2

Step 1: write each problem in expanded form then rewrite with exponents but no parentheses.

a) $(x^5)^2$ b) $(y^2 x^7)^2$ c) $(3x^7)^3$
 x^{10}

Step 2 Generalize $(a^m)^n = a^{mn}$

Step 3 Practice

a) $(x^9)^3 = x^{27}$

b) $(y^2 x^3)^4 = y^8 x^{12}$

c) $(2x^2 y^5)^3 = 8x^6 y^{15}$
 $2^3 x^6 y^{15}$

d) $(4x^3 y^4)^2 \cdot 3x^2 = 48x^8 y^{12}$
 $4^2 x^6 y^{12} \cdot 3x^2$
 $16x^6 y^{12} \cdot 3x^2$