

4.1 Exponents

50^7 8^9 15^{10}

3^2

Exponent
-how many bases
you multiply

Base
(Big Number)
-the number
you multiply

$3^2 = \text{three squared}$
 $3^3 = \text{three cubed}$

3^2 means 3*3

Exponent = repeated multiplication ★

To evaluate a power, write the factors and multiply!!

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Example 1 Write using exponents (exponential form)

a. $2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 4$ b. ~~$5 \cdot 5 \cdot 5 \cdot 5 \cdot 6 \cdot 6 \cdot 7 \cdot 7 \cdot 7$~~

$1x = x \cdot 2^2 \cdot 3^3 \cdot 4^1$

$5^4 \cdot 6^2 \cdot 7^3$

c.

$x \cdot 6 \cdot y \cdot y \cdot 6 \cdot 5 \cdot y \cdot 5 \cdot x \cdot 6 \cdot y \cdot y$

$5^2 \cdot 6^3 \cdot x^2 \cdot y^5$

$$2 \cdot 2 = 4 \cdot 2 = 8$$

Example 2 Evaluate

a. $9^2 = 9 \cdot 9 = \boxed{81}$

$$9 \cdot 9 = 81$$

b. $2^3 = 2 \cdot 2 \cdot 2 = \boxed{8}$

$$2 \cdot 2 \cdot 2 = 8$$

c. $4^3 = 4 \cdot 4 \cdot 4 = \boxed{64}$ ^{16 · 4}

$$4 \cdot 4 \cdot 4 = 64$$

d. $5^2 = 5 \cdot 5 = \boxed{25}$

$$5 \cdot 5 = 25$$

Example 3 Evaluate

a. $2^3 \cdot 3^2$

$$2 \cdot 2 \cdot 2 \cdot 3 \cdot 3$$

$$4 \cdot 2 \cdot 3 \cdot 3$$

$$8 \cdot 3 \cdot 3$$

$$24 \cdot 3$$

$$\boxed{72}$$

b. $5^2 \cdot 4^1$

$$5 \cdot 5 \cdot 4$$

$$25 \cdot 4$$

$$\boxed{100}$$

c. $(-3)^3 - 4^2$

$$\begin{array}{r} 24 \\ \times 3 \\ \hline 72 \end{array}$$