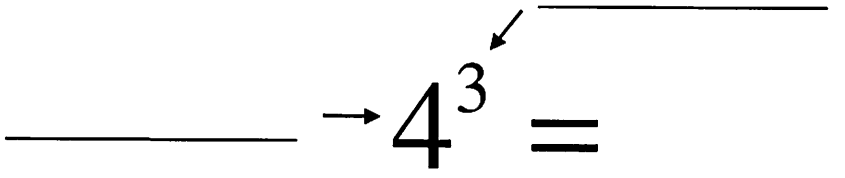
"I Can Simplify Numerical Expressions with Exponents."

Introducing Exponents

Before we start evaluating expressions, we need to talk about exponents.



Express the following using Exponents (Exponent Form).

1. $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7$

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

3. 5

4. $a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a$

5. $3 \cdot 3 \cdot 3 + 4 \cdot 4$

6. $2 \cdot 2 \cdot 8 \cdot 8 \cdot 8 \cdot 8$

Express the following as a product of factors (Expanded Form).

1. 15^4

2. 4^2

3. c^9

4. $6^3 + 2^2 \cdot 5^2$

Express the following in Expanded Form and then in Standard Form

1. 5^3

2. 2^5

Let's tie this into our Order of Operations.

P

E

M ←→ D

A ←→ S

1. $3 \cdot 6^2 + 4$	2. $24 \div 2^3 + 6$
3. $5^2 + 8 \div 2$	4. $25 - 8 \cdot 2 + 3^3$
5. $6 \cdot (13-7) \div (8-5)^2$	6. $12 \div 4 + (4^3 - 6)$

"I Can Simplify Numerical Expressions with Exponents."

Introducing Exponents

Before we start evaluating expressions, we need to talk about exponents.

base → 4^3 = exponent / power

$4 \cdot 4 \cdot 4 = 64$

16 · 4

Express the following using Exponents (Exponent Form).

1. $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7$

7^6

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

3^4

3. 5

5^1

4. $a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a \cdot a$

a^8

5. $3 \cdot 3 \cdot 3 + 4 \cdot 4$

$3^3 + 4^2$

6. $2 \cdot 2 \cdot 8 \cdot 8 \cdot 8 \cdot 8$

$2^2 \cdot 8^4$

Express the following as a product of factors (Expanded Form).

1. 15^4

$15 \cdot 15 \cdot 15 \cdot 15$

2. 4^2

$4 \cdot 4$

3. c^9

$c \cdot c \cdot c \cdot c \cdot c \cdot c \cdot c \cdot c \cdot c$

4. $6^3 + 2^2 \cdot 5^2$

$6 \cdot 6 \cdot 6 + 2 \cdot 2 \cdot 5 \cdot 5$

Express the following in Expanded Form and then in Standard Form

1. 5^3 $5 \cdot 5 \cdot 5$

$25 \cdot 5$

125

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

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

$8 \cdot 2 \cdot 2$

$16 \cdot 2$

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Let's tie this into our Order of Operations.

P

E

M ←→ D

A ←→ S

1. $3 \cdot 6^2 + 4$ $6 \cdot 6$ $3 \cdot 36 + 4$ $108 + 4$ 112 P ~~P~~ E M ~~D~~ A ~~S~~	2. $24 \div 2^3 + 6$ $2 \cdot 2 \cdot 2$ $24 \div 8 + 6$ $3 + 6$ 9 ~~P~~ E ~~M~~ D A ~~S~~
3. $5^2 + 8 \div 2$ $5 \cdot 5$ $25 + 8 \div 2$ $25 + 4$ 29 P E M D A ~~S~~	4. $25 - 8 \cdot 2 + 3^3$ $3 \cdot 3 \cdot 3$ $25 - 8 \cdot 2 + 27$ $25 - 16 + 27$ $9 + 27$ 36 P E ~~M~~ A S
5. $6 \cdot (13-7) \div (8-5)^2$ $6 \cdot 6 \div 3^2$ $3 \cdot 3$ $6 \cdot 6 \div 9$ $36 \div 9$ 4 P E M D ~~A~~ S	6. $12 \div 4 + (4^3 - 6)$ $4 \cdot 4 \cdot 4$ $12 \div 4 + (64 - 6)$ $12 \div 4 + 58$ $3 + 58$ 61 P E ~~M~~ D A S