Properties of Exponents

Section 8.1

Exponents

- **Definition:**
  - a short hand way to write multiplication

- **Examples**:
  - $4 \cdot 4 = 4^2$
  - $4 \cdot 4 \cdot 4 = 4^3$
  - $4 \cdot 4 \cdot x \cdot x \cdot x = 4^2x^3 = 16\,x^3$

Properties

- $a^m \cdot a^n = a^{m+n}$

- Examples:

Properties

- $(a^m)^n = a^{mn}$
- Examples:

Properties

- $(ab)^m = a^m b^m$

- Examples:

Exponents & Negative numbers

- When negative numbers are raised to an exponent, the following rules hold true:
  - If the exponent is **odd**- the answer is **negative**
  - If the exponent is **even**- the answer is **positive**

- Examples:

EXTRA EXAMPLES

1.) $[(2x+3)^4]^2$

2.) $2x^2(3x)^3$

AND MORE

3.) $(-a^3)^4$

4.) $4^2 \cdot (4a^3)^6$

5.) $(-2a^4)^2 \bullet (3a)^4$