Exponents

Terminology

1. Given the expression: $a^b = x$, identify the (1) base, (2) exponent, and (3) power.

Abstract Mastery

1. $a^x + a^y$
2. $a^x * a^y$
3. $\frac{a^x}{a^y}$
4. $(a^x)^y$
5. a^1
6. a^0
7. a^{-1}
8. a^{-2}
9. $a^x * a^{-x}$
10. $(a^x)^{\frac{1}{x}}$
11. $\frac{a^{-b}}{x^{-y}}$
12. $\frac{a^6 * b^3}{a^4 * b^5}$

Concrete Mastery

Find the powers to the expressions below.

1. 0^0
2. $4^{2.5}$
3. $8^{\frac{2}{3}}$
4. 16^0
5. $16^{\frac{1}{2}}$

6. $16^{\frac{1}{4}}$
7. $16^{\frac{3}{4}}$
8. 16^{-2}
9. $16^{-\frac{1}{2}}$
10. $(16^4 * 16^{-4})^{-4}$
11. $\frac{17^4 * 17^{-9} * 13^3 * 13^{-2}}{17^{-6} * 13^0}$

Narrative Mastery

Give an informal explanation for how you would simplify these expressions:

- $a^x * a^y$
- $\frac{a^x}{a^y}$
- $(a^x)^y$