

### Laws of exponents

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$(a^m)^n = a^{mn}$$

$$(a/b)^m = a^m / b^m$$

$$(a \pm b)^m \neq a^m \pm b^m$$

$$a^{-m} = 1 / a^m$$

$$a^{m/n} = \sqrt[n]{a^m}$$

$$1^a = 1$$

$$a^0 = 1$$

$$0^a = 0$$

$$0^0 \rightarrow \text{not defined}$$

### Radicals

even root of positive number  $\rightarrow$  positive and negative

even root of negative number  $\rightarrow$  none

odd root of positive number  $\rightarrow$  positive

odd root of negative number  $\rightarrow$  negative

### Operations

$$a \sqrt[n]{c} \pm b \sqrt[n]{c} = (a \pm b) \sqrt[n]{c}$$

$$a \sqrt[n]{c} \times b \sqrt[n]{d} = (a \times b) \sqrt[n]{c \times d}$$

### Conjugate

$$\sqrt[n]{a} + \sqrt[n]{b} \rightarrow \sqrt[n]{a} - \sqrt[n]{b}$$

$$\sqrt[n]{a} - \sqrt[n]{b} \rightarrow \sqrt[n]{a} + \sqrt[n]{b}$$

### Finding the root of $x \pm 2\sqrt{y}$

$$\sqrt{((a+b) + 2\sqrt{ab})} = \sqrt{a} + \sqrt{b}$$

### Properties of logarithms



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