

Algebra 2/ Trig.

Name: _____

Properties of Logarithms

Prior Knowledge - Three Properties of Exponents.

$$(a^m)(a^n) =$$

$$\frac{a^m}{a^n} =$$

$$(a^m)^n =$$

Investigate

May use calculator.

$$1) \log 100 + \log 1000 = \underline{\hspace{2cm}} \quad \log 100,000 = \underline{\hspace{2cm}}$$

$$2) \log 2 + \log 4 = \underline{\hspace{2cm}} \quad \log 8 = \underline{\hspace{2cm}}$$

$$3) \log 9 + \log 3 = \underline{\hspace{2cm}} \quad \log 27 = \underline{\hspace{2cm}}$$

Conclusion: Product Property

$$\log m + \log n = \underline{\hspace{2cm}}$$

$$\log (mn) = \underline{\hspace{2cm}}$$

Investigate

$$4) \log 10000 - \log 100 = \underline{\hspace{2cm}} \quad \log \left(\frac{10000}{100} \right) = \underline{\hspace{2cm}}$$

$$5) \log 4 - \log 2 = \underline{\hspace{2cm}} \quad \log \left(\frac{4}{2} \right) = \underline{\hspace{2cm}}$$

$$6) \log 16 - \log 4 = \underline{\hspace{2cm}} \quad \log \left(\frac{16}{4} \right) = \underline{\hspace{2cm}}$$

Conclusion: Quotient Property

$$\log m - \log n = \underline{\hspace{2cm}}$$

$$\log \left(\frac{m}{n} \right) = \underline{\hspace{2cm}}$$

Investigate

$$7) \log (3^2) = \log (\underline{\hspace{1cm}} \cdot \underline{\hspace{1cm}}) = \log (\underline{\hspace{1cm}}) + \log (\underline{\hspace{1cm}}) = \underline{\hspace{1cm}} \log (\underline{\hspace{1cm}})$$

$$8) \log (4^2) = \log (\underline{\hspace{1cm}} \cdot \underline{\hspace{1cm}}) = \log (\underline{\hspace{1cm}}) + \log (\underline{\hspace{1cm}}) = \underline{\hspace{1cm}} \log (\underline{\hspace{1cm}})$$

Conclusion: Power Property

$$\log (m^n) = \underline{\hspace{2cm}}$$

$$n \log (m) = \underline{\hspace{2cm}}$$