The Laws of Logarithms: Products & Quotients & Powers & Roots

The Law of Logarithms with regard to Products and Quotients of Numbers *

Many times students see no value in these type of problems, however, when confronted with an advanced problem where these laws apply they will.

The Log of a Product equals the Sum of the Logs * $\text{Log}(A) \times (B) = \text{Log}(A) + \text{Log}(B)$

$(.046) \times (7384) = N$	Determine the Product using Logs.
$(\text{Log})\ (.046) \times (7384) = N\ (\text{Log})$	Take the Log of both Sides
$(\text{Log})\ (.046)\ (\text{Log})\ (7384) = \text{Log}\ N$	Distribute the Log on both sides
$\_\_\_\_ + \_\_\_\_ = \text{Log}\ N$	Determine Log of ( ) & ( ) then Add
$(\text{Anti})\ \_\_\_\_ = \text{Log}\ N\ (\text{Anti})$	Take the AntiLog of both sides
$\_\_\_\_ = N$	Check N in $10^{\text{E}} = N$

The Log of a Quotient equals the Difference of the Logs * $\text{Log}(A) \times (B) = \text{Log}(A) + \text{Log}(B)$

$(528) / (.073) = N$	Determine the Quotient using Logs.
$(\text{Log})\ (528) / (.073) = N\ \ (\text{Log})$	Take the Log of both Sides
$(\text{Log})\ (528)\ -\ (\text{Log})\ (.073) = \text{Log}\ N$	Distribute the Log on both sides
$\_\_\_\_ - \_\_\_\_ = \text{Log}\ N$	Determine Log of ( ) & ( ) then Subtract
$(\text{Anti})\ \_\_\_\_ = \text{Log}\ N\ (\text{Anti})$	Take the AntiLog of both sides
$\_\_\_\_ = N$	Check N in $10^{\text{E}} = N$

Tom Love Malone College Fall 2003

The Law of Logarithms with regard to Products and Quotients of Numbers *

Many times students see no value in these type of problems, however, when confronted with an advanced problem where these laws apply they will.

The Log of a Product equals the Sum of the Logs * $\text{Log}(A) \times (B) = \text{Log}(A) + \text{Log}(B)$

$(.046) \times (7384) = N$	Determine the Product using Logs.
$(\text{Log})\ (.046) \times (7384) = N\ (\text{Log})$	Take the Log of both Sides
$(\text{Log})\ (.046)\ (\text{Log})\ (7384) = \text{Log}\ N$	Distribute the Log on both sides
$\_\_\_\_ + \_\_\_\_ = \text{Log}\ N$	Determine Log of ( ) & ( ) then Add
$(\text{Anti})\ \_\_\_\_ = \text{Log}\ N\ (\text{Anti})$	Take the AntiLog of both sides
$\_\_\_\_ = N$	Check N in $10^{\text{E}} = N$

The Log of a Quotient equals the Difference of the Logs * $\text{Log}(A) \times (B) = \text{Log}(A) + \text{Log}(B)$

$(528) / (.073) = N$	Determine the Quotient using Logs.
$(\text{Log})\ (528) / (.073) = N\ \ (\text{Log})$	Take the Log of both Sides
$(\text{Log})\ (528)\ -\ (\text{Log})\ (.073) = \text{Log}\ N$	Distribute the Log on both sides
$\_\_\_\_ - \_\_\_\_ = \text{Log}\ N$	Determine Log of ( ) & ( ) then Subtract
$(\text{Anti})\ \_\_\_\_ = \text{Log}\ N\ (\text{Anti})$	Take the AntiLog of both sides
$\_\_\_\_ = N$	Check N in $10^{\text{E}} = N$

Tom Love Malone College Fall 2003

The Law of Common Logarithms with regard to Powers and Roots of Numbers *

Many times students see no value in these type of problems, however, when confronted with an advanced problems where these laws apply they will.

The Log of a Power equals the Power X the Log of Number * $\text{Log}(A)^{\text{r}} = \text{P} \times \text{Log}(A)$

$(648)^{7} = N$	Determine the Seventh Power of (648)
$(\text{Log})\ \ (648)^{7} = N\ \ \ (\text{Log})$	Take the Log of both Sides
$7 \times (\text{Log})\ (648) = \text{Log}\ N$	Distribute the Log on both sides
$7 \times \_\_\_\_ = \text{Log}\ N$	Determine Log of ( ) & Multiply by 7
$(\text{Anti})\ \_\_\_\_ = \text{Log}\ N\ (\text{Anti})$	Take the AntiLog of both sides
$\_\_\_\_ = N$	Check N in $10^{\text{E}} = N$

The Log of a Root equals the Root X the Log of Number * $\text{Log}(A)^{\text{R}} = \text{R} \times \text{Log}(A)$

$(.007)^{1/5} = N$	Determine the Fifth Root of (.007)
$(\text{Log})\ \ (648)^{7/5} = N\ \ (\text{Log})$	Take the Log of both Sides
$(1/5) \times (\text{Log})\ (648) = \text{Log}\ N$	Distribute the Log on both sides
$(1/5) \times \_\_\_\_ = \text{Log}\ N$	Determine Log of ( ) & Multiply by (1/5)
$(\text{Anti})\ \_\_\_\_ = \text{Log}\ N\ (\text{Anti})$	Take the AntiLog of both sides
$\_\_\_\_ = N$	Check N in $10^{\text{E}} = N$

Tom Love Malone College Fall 2003

The Law of Common Logarithms with regard to Powers and Roots of Numbers *

Many times students see no value in these type of problems, however, when confronted with an advanced problems where these laws apply they will.

The Log of a Power equals the Power X the Log of Number * $\text{Log}(A)^{\text{r}} = \text{P} \times \text{Log}(A)$

$(648)^{7} = N$	Determine the Seventh Power of (648)
$(\text{Log})\ \ (648)^{7} = N\ \ \ (\text{Log})$	Take the Log of both Sides
$7 \times (\text{Log})\ (648) = \text{Log}\ N$	Distribute the Log on both sides
$7 \times \_\_\_\_ = \text{Log}\ N$	Determine Log of ( ) & Multiply by 7
$(\text{Anti})\ \_\_\_\_ = \text{Log}\ N\ (\text{Anti})$	Take the AntiLog of both sides
$\_\_\_\_ = N$	Check N in $10^{\text{E}} = N$

The Log of a Root equals the Root X the Log of Number * $\text{Log}(A)^{\text{R}} = \text{R} \times \text{Log}(A)$

$(.007)^{1/5} = N$	Determine the Fifth Root of (.007)
$(\text{Log})\ \ (648)^{7/5} = N\ \ (\text{Log})$	Take the Log of both Sides
$(1/5) \times (\text{Log})\ (648) = \text{Log}\ N$	Distribute the Log on both sides
$(1/5) \times \_\_\_\_ = \text{Log}\ N$	Determine Log of ( ) & Multiply by (1/5)
$(\text{Anti})\ \_\_\_\_ = \text{Log}\ N\ (\text{Anti})$	Take the AntiLog of both sides
$\_\_\_\_ = N$	Check N in $10^{\text{E}} = N$

Tom Love Malone College Fall 2003