Check it Out

- If you have any difficulty with these solutions, please contact your teacher before continuing.

1.

Investigating the Product Law of Logarithms		
$\log 12 + \log 2 = 1.380\ldots$ $\log 6 + \log 4 = 1.380\ldots$ $\log 8 + \log 3 = 1.380\ldots$		

2. All three expressions have the same value. The three logarithmic expressions all have numbers that multiply to equal 24.

3.

Investigating the Product Law of Logarithms		
$\log 12 + \log 2 = 1.380\ldots$ $\log 6 + \log 4 = 1.380\ldots$ $\log 8 + \log 3 = 1.380\ldots$	$\log 24 = 1.380\ldots$	

4. The values of the expressions in the first column are equal to the value of the expression in second column.

5.

Investigating the Product Law of Logarithms		
$\log 12 + \log 2 = 1.380\ldots$ $\log 6 + \log 4 = 1.380\ldots$ $\log 8 + \log 3 = 1.380\ldots$	$\log 24 = 1.380\ldots$	$\log m + \log n = \log mn$

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6.

Investigating the Quotient Law of Logarithms		
$\log 12 - \log 6 = 0.301\ldots$ $\log 8 - \log 4 = 0.301\ldots$ $\log 6 - \log 3 = 0.301\ldots$		

7. All three expressions have the same value. The three logarithmic expressions all have numbers that divide to equal 2.

8.

Investigating the Quotient Law of Logarithms		
$\log 12 - \log 6 = 0.301\ldots$ $\log 8 - \log 4 = 0.301\ldots$ $\log 6 - \log 3 = 0.301\ldots$	$\log 2 = 0.301\ldots$	

9. The values of the expressions in the first column are equal to the value of the expression in the second column.

10.

Investigating the Quotient Law of Logarithms		
$\log 12 - \log 6 = 0.301\ldots$ $\log 8 - \log 4 = 0.301\ldots$ $\log 6 - \log 3 = 0.301\ldots$	$\log 2 = 0.301\ldots$	$\log m - \log n = \log\left(\dfrac{m}{n}\right)$

Check it Out

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11.

Investigating the Power Law of Logarithms		
$\log 2 = \log 2^1 = 0.301\ldots$		
$\log 4 = \log 2^2 = 0.602\ldots$		
$\log 8 = \log 2^3 = 0.903\ldots$		
$\log 16 = \log 2^4 = 1.204\ldots$		

12. All four expressions in the first column have different values; however, they appear to be increasing by equal amounts.

13.

Investigating the Power Law of Logarithms		
$\log 2 = \log 2^1 = 0.301\ldots$	$1 \cdot \log 2 = 0.301\ldots$	
$\log 4 = \log 2^2 = 0.602\ldots$	$2 \cdot \log 2 = 0.602\ldots$	
$\log 8 = \log 2^3 = 0.903\ldots$	$3 \cdot \log 2 = 0.903\ldots$	
$\log 16 = \log 2^4 = 1.204\ldots$	$4 \cdot \log 2 = 1.204\ldots$	

14. The values for each expression in the second column are equal to the corresponding value in the first column.

15.

Investigating the Power Law of Logarithms		
$\log 2 = \log 2^1 = 0.301\ldots$	$1 \cdot \log 2 = 0.301\ldots$	$\log m^n = n \log m$
$\log 4 = \log 2^2 = 0.602\ldots$	$2 \cdot \log 2 = 0.602\ldots$	
$\log 8 = \log 2^3 = 0.903\ldots$	$3 \cdot \log 2 = 0.903\ldots$	
$\log 16 = \log 2^4 = 1.204\ldots$	$4 \cdot \log 2 = 1.204\ldots$	