Using Logarithm Rules

Let's use multiple logarithm rules on the same expression.

19.1 Which Three Go Together: Logarithm Rules

Which three go together? Why do they go together?

A

$$\log(4) + \log(250)$$

B

$$\log(100)$$

C

$$\log_2(100) - \log_2(50)$$

D

$$3 \cdot \ln(100)$$

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19.2 Using Multiple Logarithm Rules

Combine each expression into an equivalent expression of a single logarithm. Be prepared to explain your reasoning.

1. $\log_5(4) + \log_5(6) + \log_5(10)$

2. $\log_3(100) - \log_3(2) - \log_3(5)$

3. $\log(6) + \log(3) - \log(8) - \log(9)$

4. $\ln 11 + 3 \cdot \ln(2)$

5. $-2 \cdot \log_{16}(5) - \log_{16}(2) + \log_{16}(7)$

19.3 Card Sort: Logarithm Rules

Your teacher will give you a set of cards. Each card contains a logarithm expression.

Sort the expressions into groups so that the value of the expressions in each group is the same. Be prepared to explain how you know where each expression belongs.

Lesson 19 Summary

Logarithm rules can be used in combination to write equivalent expressions. For example, the expression $\frac{\log(7)}{\log(3)} + \log_3(2) - \log_3(5)$ is equivalent to $\log_3(7) + \log_3(2) - \log_3(5)$ by the change of base rule. Then, using the product and quotient rules, this expression is also equivalent to $\log_3\left(\frac{14}{5}\right)$.