Name:
Date:

Pre-Assessment Review

Adding LOGs

Rule: **LOG A + LOG B = LOG AB**
To add LOGS we multiply their arguments.

Practice:
Express each as a single LOG:

1. LOG 5 + LOG 2 = LOG ___
2. LOG 16 + LOG 4 = LOG ___
3. LOG 15 + LOG 2 = LOG ___

Express each as a sum of LOGS:

4. LOG (5•4) = LOG _____ + LOG _____
5. LOG $3x$ = LOG _____ + LOG _____
6. LOG xy = LOG _____ + LOG _____

Subtracting LOGs

Rule: **LOG A – LOG B = LOG A/B**
To subtract LOGS we divide their arguments.

Important Vocabulary:
The number that comes after the word LOG is referred to as *the argument.*

Practice:
Express each as a single LOG:

1. LOG 20 – LOG 4 = LOG_____
2. LOG 10 – LOG 5 = LOG_____
3. LOG 256 – LOG 128 = LOG_____

Express each LOG as the difference of LOGS:

4. LOG $\frac{10}{5}$ = LOG _____ – LOG _____
5. LOG $\frac{x}{4}$ = LOG _____ – LOG _____
6. LOG $\frac{x}{y}$ = LOG _____ – LOG _____

Multiple LOGs & Fractions of LOGs

Rule: **B • LOG A = LOG A^B**

To multiply a LOG by a constant we can raise the argument to power of that constant.

Practice:

Express each product as a single LOG:

1. 3 • LOG 4 = LOG____
2. 2 • LOG 5 = LOG____
3. $\frac{1}{2}$ • LOG 25 = LOG____
4. $\frac{1}{5}$ • LOG 1024= LOG____

Express each LOG as product:

5. LOG 2^5 =
6. LOG 7^9 =
7. LOG x^{10} =
8. LOG Z^x =

LOG 1

Rule: **LOG 1 = 0**

The LOG 1 is always equal to zero.

Where do LOGs come from?
Both John Napier (1550-1617), Scottish baron, and Joost Bürgi (1552-1632), a Swiss craftsman, independently invented the idea of LOGs within a years of each another!

Practice:

1. LOG 1 =
2. LOG 5 – LOG 5 = LOG ____ = ____
3. $\left(\frac{234}{245672}\right)^{\text{LOG } 1} =$
4. Why is there is no LOG 1 piece in your set of FiCycle LOGs?

Putting it all together…. and taking it all apart

Using the LOG rules, break apart each single LOG into a sum, product, and/or difference of as many different LOGS as possible.

Example:

$$\begin{aligned}
\text{LOG}\left(\frac{4x}{7y}\right)^2 &= 2 \cdot \text{LOG}\frac{4x}{7y} \\
&= 2(\text{LOG}\,4\text{X} - \text{LOG}\,7y) \\
&= 2\,\text{LOG}\,4\text{X} - 2\,\text{LOG}\,7y \\
&= 2(\text{LOG}\,4 + \text{LOG}\,\text{X}) - 2(\text{LOG}\,7 + \text{LOG}\,y) \\
&= 2\,\text{LOG}\,4 + 2\,\text{LOG}\,\text{X} - 2\,\text{LOG}\,7 - 2\,\text{LOG}\,y
\end{aligned}$$

Practice:

1. LOG $\frac{6x}{11y}$ =
2. LOG $\left(\frac{2x}{3y}\right)^9$