Unit10 Day 3 HW

Quiz today on Days 1 & 2
No Calculator
Start warm-up

1. See graph on next slide

   Asymptote x = -1

2. 3log x + log y
3. $\frac{1}{2}$ log a - log b
4. 3 log x + log y - 2log z
5. 2log r - log s - 1/2log t
6. (2)
7. (1)
8. (4)
9. {5}
10. {3}
11. {2/3}
12. {1/2}

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Name_____

Date_____

1. Graph $y = \log_3(x + 1) + 2$

   Hint : Start by finding $y = 3^x$

$y = 3^x$

x	-2	-1	0	1	2
y	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9

dont graph

switch x and y

$y = \log_3 x$

x	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9
y	-2	-1	0	1	2

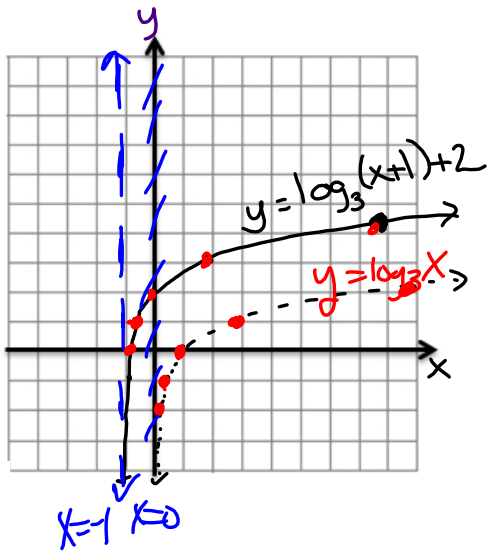
graph

$y = \log_3(x+1)+2$ left 1, up 2

Equation of the asymptote? $x = -1$

Alg 2 CC

Unit10 Day 3 HW



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Use the laws of logarithms to expand questions 2 - 5.

2. $\log x^3y =$ $3\log x + \log y$

3. $\log \frac{\sqrt{a}}{b} =$ $\log a^{1/2} - \log b = \frac{1}{2}\log a - \log b$

4. $\log \frac{x^3y}{z^2} =$ $\log x^3 + \log y - \log z^2 = 3\log x + \log y - 2\log z$

5. $\log \frac{r^2}{s\sqrt{t}} =$ $\log r^2 - (\log s + \log t^{1/2})$
$= 2\log r - \log s - \frac{1}{2}\log t$

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6. Which of the following is equivalent to $\log_3(9x)$?

(1) $\log_3 2 + \log_3 x$ (2) $2 + \log_3 x$

(3) $2\log_3 x$ (4) $x + \log_3 2$

$\log_3 9 + \log_3 x$
$2 + \log_3 x$
$\log_3 9 = x$
$3^x = 9 \quad 3^x = 3^2$
$x = 2$

7. The expression of $\log \frac{x^2}{10}$ is equivalent to

(1) $2\log x - 1$ (2) $2\log x - 10$

(3) $\log 2x - 1$ (4) $\log 2x - 10$

$\log x^2 - \log 10$
$2\log x - \log 10$
$2\log x - 1$

8. If $f(x) = \log x$ and $g(x) = 100x^3$, then $f(g(x)) =$

(1) $100\log x$ (2) $300\log x$

(3) $6 + \log x$ (4) $2 + 3\log x$

$= \log(100x^3)$
$= \log 100 + \log x^3$
$= \log 100 + 3\log x$
$= 2 + 3\log x$

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9. Solve for x.

$\log_x 25 = 2$

$\sqrt{x^2} = \sqrt{25}$

$x = \pm 5$

reject -5 $\{5\}$ $\{5\}$

10. Evaluate $\log_3 27$

$\log_3 27 = x$ $3^x = 27$ $x = 3$ $\{3\}$

11. Solve for x.

$4^{3x} = 16$

$4^{3x} = 4^2$ $3x = 2$ $x = 2/3$ $\{2/3\}$

12. Solve for x.

$5^{4x-5} = \frac{1}{125}$

$5^{4x-5} = 5^{-3}$

$4x - 5 = -3$ $\{1/2\}$

$4x = 2$

$x = 1/2$

Warm-up

What is the inverse of:

1) $y = 2^x \rightarrow x = 2^y \rightarrow y = \log_2 x$ ~~$y = \log 2^x$~~

2) $y = \log_3 x$ $x = \log_3 y$ $3^x = y$ $y = 3^x$

3) $y = (\frac{1}{2})^x$ $x = (\frac{1}{2})^y$ or $y = \log_{1/2} x$

4) $y = \log_{1/3} x$ $x = \log_{1/3} y$ $(\frac{1}{3})^x = y$ or $y = (\frac{1}{3})^x$

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QUIZ

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More Properties of Logs

Unit 10 Day 4

Warm-up

The expression of $\log\left(\frac{x^2}{1000}\right)$ can be written in equivalent form as

(1) $2\log x - 3$
(2) $2\log x - 6$
(3) $\log 2x - 3$
(4) $\log 2x - 6$

$= \log x^2 - \log 1000$
$= 2\log x - \log 1000 =$

$10^? = 1000$

If $\log 5 = p$ and $\log 2 = q$ then $\log 200$ can be written in terms of p and q as

(1) $4p + q$
(2) $2(p + q)$
(3) $2p + 3q$
(4) $3p + 2q$

$\log 200$
$= \log 5^2 \cdot 2^3$
$= \log 5^2 + \log 2^3$
$= 2\log 5 + 3\log 2$
$= 2p + 3q$

200
100
50
25
5 5
2 2 2

$5 \cdot 5 \cdot 2 \cdot 2 \cdot 2$
$5^2 \cdot 2^3$

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More Properties of Logarithms

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More Properties of Logs Unit10 Day 4

Reverse Rules of Logs

$\log a + \log b =$ $\log ab$

$\log a - \log b =$ $\log \frac{a}{b}$

$n \log a =$ $\log a^n$

$\frac{1}{n}\log a =$ $\log a^{1/n} = \log \sqrt[n]{a}$

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Express as a single logarithm: Squish

1. $2\log a - \log b = \log a^2 - \log b = \log \frac{a^2}{b}$

2. $\log a - \frac{1}{2}\log b = \log a - \log \sqrt{b} = \log \frac{a}{\sqrt{b}}$

3. $3\log x + \frac{1}{2}\log y = \log x^3 + \log y^{1/2} = \log x^3 + \log \sqrt{y}$
$= \log x^3\sqrt{y}$

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4. $\log x^3y^5 - \log xy^3 = \log \frac{x^3y^5}{xy^3} = \log x^2y^2$

5. $\log a - 1/3\log b - 1/3\log c = \log a - \log b^{1/3} - \log c^{1/3}$
$= \log a - \log \sqrt[3]{b} - \log \sqrt[3]{c}$
$= \log \frac{a}{\sqrt[3]{b}\sqrt[3]{c}}$
$= \log \frac{a}{\sqrt[3]{b \cdot c}}$

$= \log a - 1(\log \sqrt[3]{b} + \log \sqrt[3]{c})$
$= \log a - 1(\log \sqrt[3]{b} \cdot \sqrt[3]{c})$

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Express as a single logarithm. Simplify if possible.

8. $\log_6 3 + \log_6 2 =$ $\log_6(3 \cdot 2) = \log_6 6 = 1$

9. $\log_8 16 + \log_8 4 =$ $\log_8(16 \cdot 4) = \log_8 64 = 2$ $\quad 8^4 = 4096$

11. $\log_8 80 + \log_8 51.2 =$ $\log_8(80 \cdot 51.2) = \log_8(4096) = 4$

12. $\log 2 + \log 25 - \log 5 =$ $\log\left(\frac{2 \cdot 25}{5}\right) = \log\left(\frac{50}{5}\right) = \log_{10} 10 = 1$

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13. Which of the following is not equivalent to log 36?

(1) log 2 + log 18 $= \log(2 \cdot 18) = \log 36$
(2) log 30 + log 6 $= \log(30 \cdot 6) = \log 180$
(3) 2log 6 $= \log 6^2 = \log 36$
(4) log 4 + log 9 $= \log(4 \cdot 9)$

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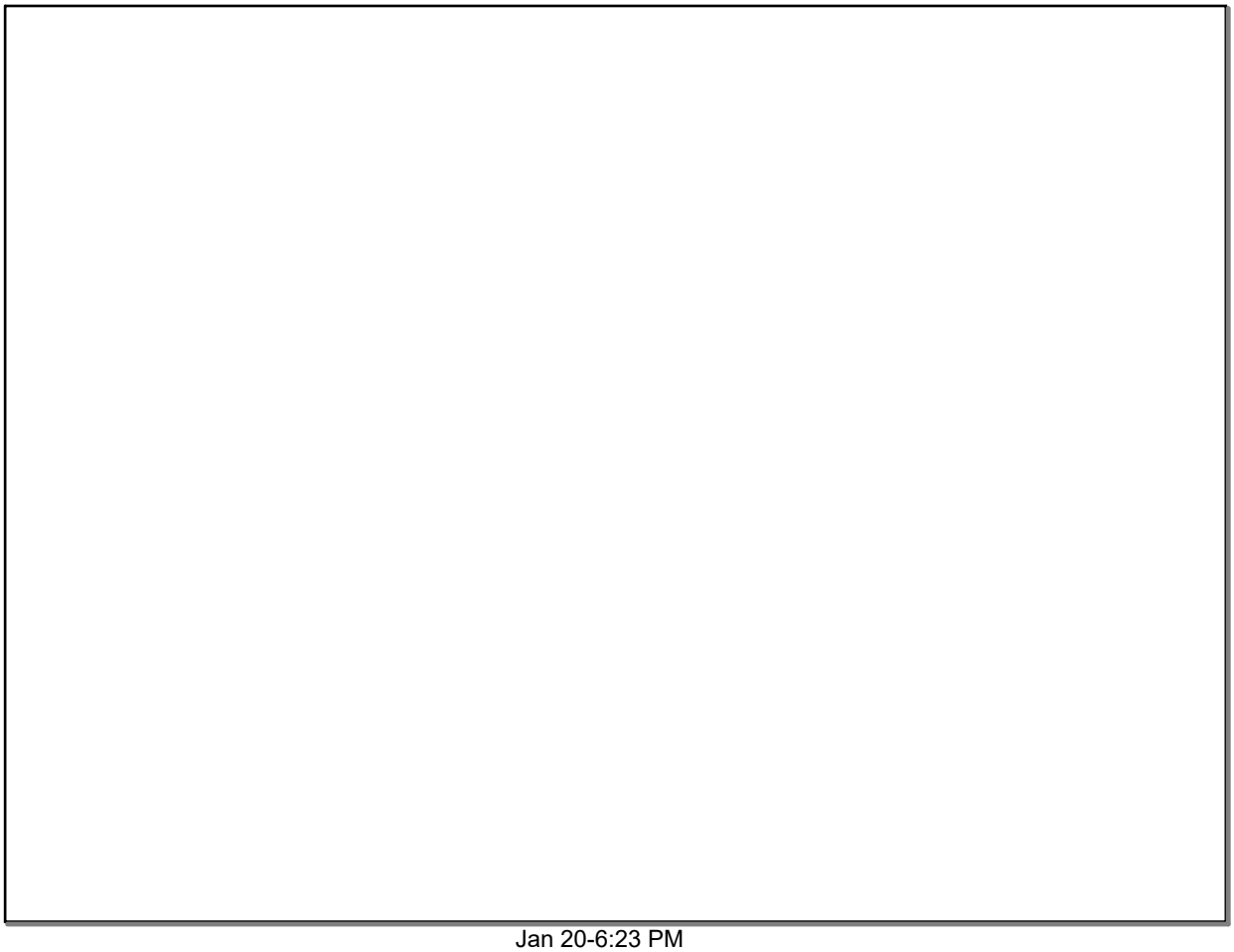

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