Questions on 2.8H HW? 2.7H HW is due today...and we are quizzing today.

Apr 6-8:48 AM

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Topic: Evaluating functions

1. *Find* $h(-11)$ *given that* $h(x) = 2x^2 + 9x - 43$.

$h(-11) = 2(-11)^2 + 9(-11) - 43$

$2(121) - 99 - 43 = 100$

2. *Find* $r(-1)$ *given that* $r(x) = -5x^2 - 3x + 9$.

3. *Find* $f(4)$, *given that* $f(x) = x^2 + 11$.

4. *Find* $m(3)$ *given that* $m(x) = log_x 81$

5. *Find* $g(-3)$ *given that* $g(x) = x^2 + 2x + 4$.

6. *Find* $p(3)$ *given that* $p(x) = 5^x + 2x$.

7. *Find* $q(2)$ *given that* $q(x) = 7^x + 11x$

8. *Find* $s\left(\frac{1}{2}\right)$ *given that* $s(x) = 12x^2$

Set Topic: Finding solutions to logarithmic equations

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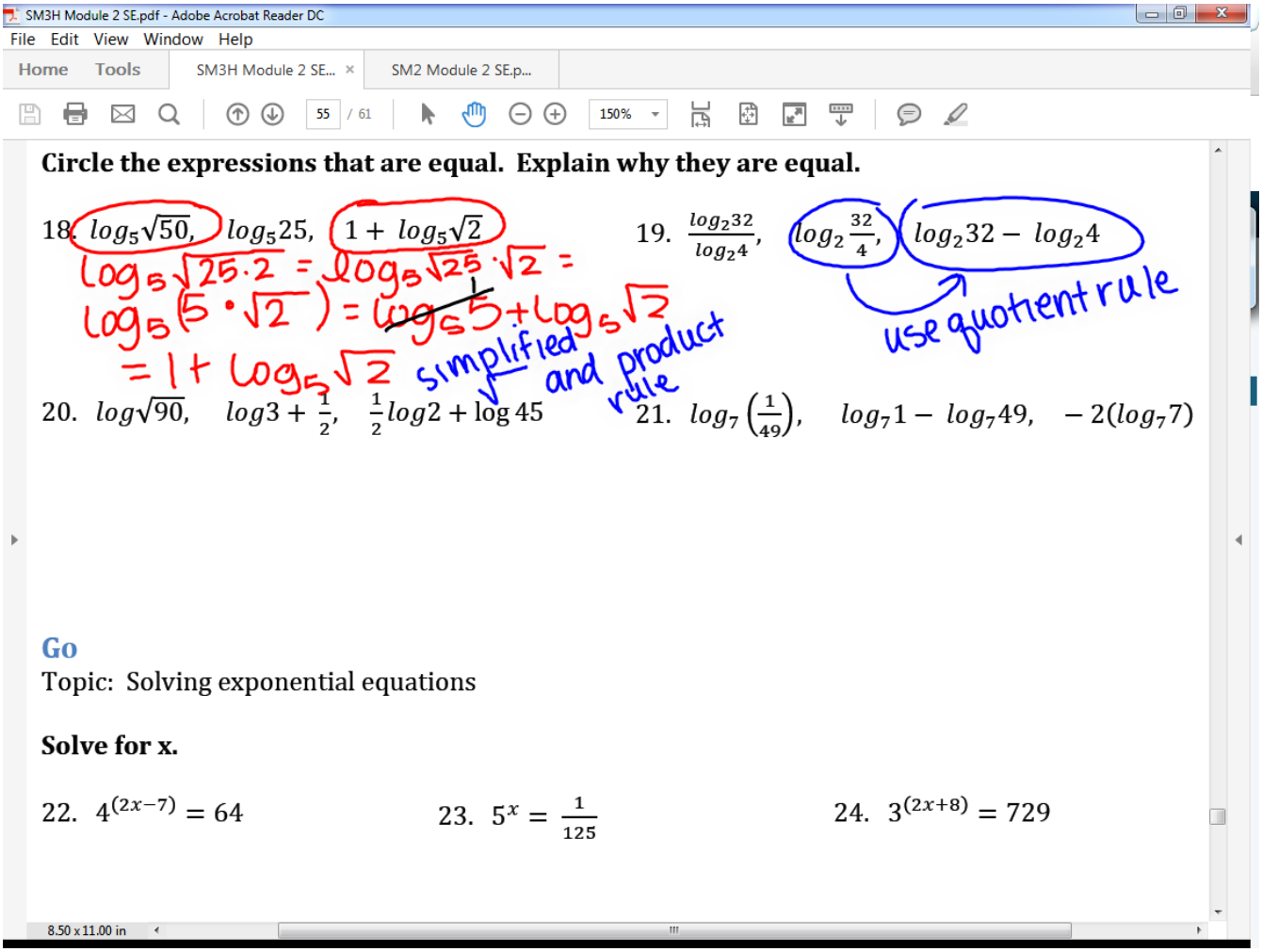
Oct 5-9:27 AM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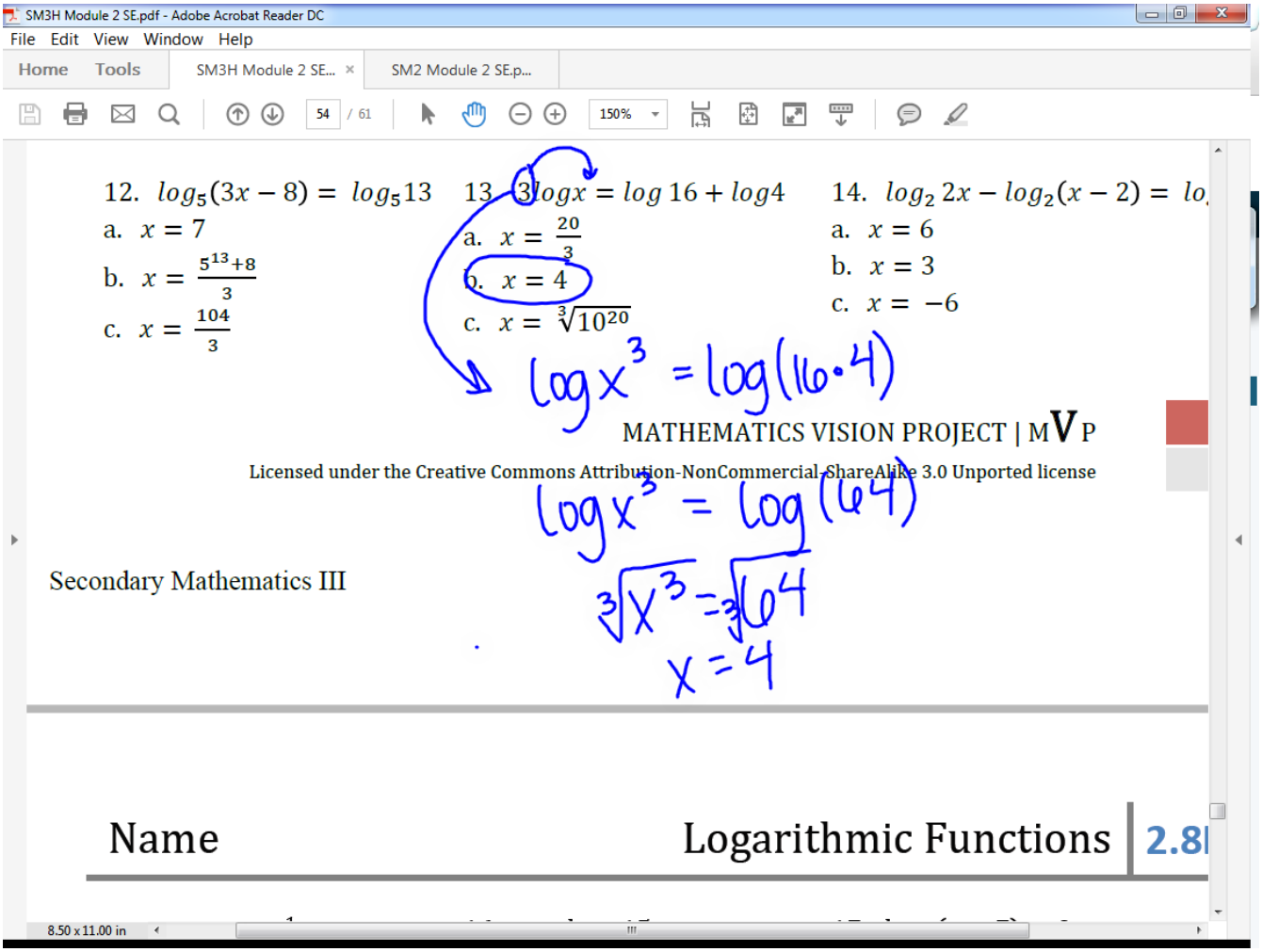
Circle the expressions that are equal. Explain why they are equal.
18. $log_5\sqrt{50}$, $log_5 25$, $1 + log_5\sqrt{2}$
$log_5\sqrt{25\cdot 2} = log_5\sqrt{25}\cdot\sqrt{2} =$
$log_5(5\cdot\sqrt{2}) = log_5 5 + log_5\sqrt{2}$
$= 1 + log_5\sqrt{2}$
simplified
and product rule
19. $\frac{log_2 32}{log_2 4}$, $log_2\frac{32}{4}$, $log_2 32 - log_2 4$
use quotient rule
20. $log\sqrt{90}$, $log3 + \frac{1}{2}$, $\frac{1}{2}log2 + \log 45$
21. $log_7\left(\frac{1}{49}\right)$, $log_7 1 - log_7 49$, $-2(log_7 7)$
Go
Topic: Solving exponential equations
Solve for x.
22. $4^{(2x-7)} = 64$
23. $5^x = \frac{1}{125}$
24. $3^{(2x+8)} = 729$
8.50 x 11.00 in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12. $log_5(3x-8) = log_5 13$
a. $x = 7$
b. $x = \frac{5^{13}+8}{3}$
c. $x = \frac{104}{3}$
13. $3log x = log\,16 + log 4$
a. $x = \frac{20}{3}$
b. $x = 4$
c. $x = \sqrt[3]{10^{20}}$
14. $log_2 2x - log_2(x-2) = lo$
a. $x = 6$
b. $x = 3$
c. $x = -6$
$\log x^3 = \log(16 \cdot 4)$
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$\log x^3 = \log(64)$
Secondary Mathematics III
$\sqrt[3]{x^3} = \sqrt[3]{64}$
$x = 4$
Name
Logarithmic Functions 2.8
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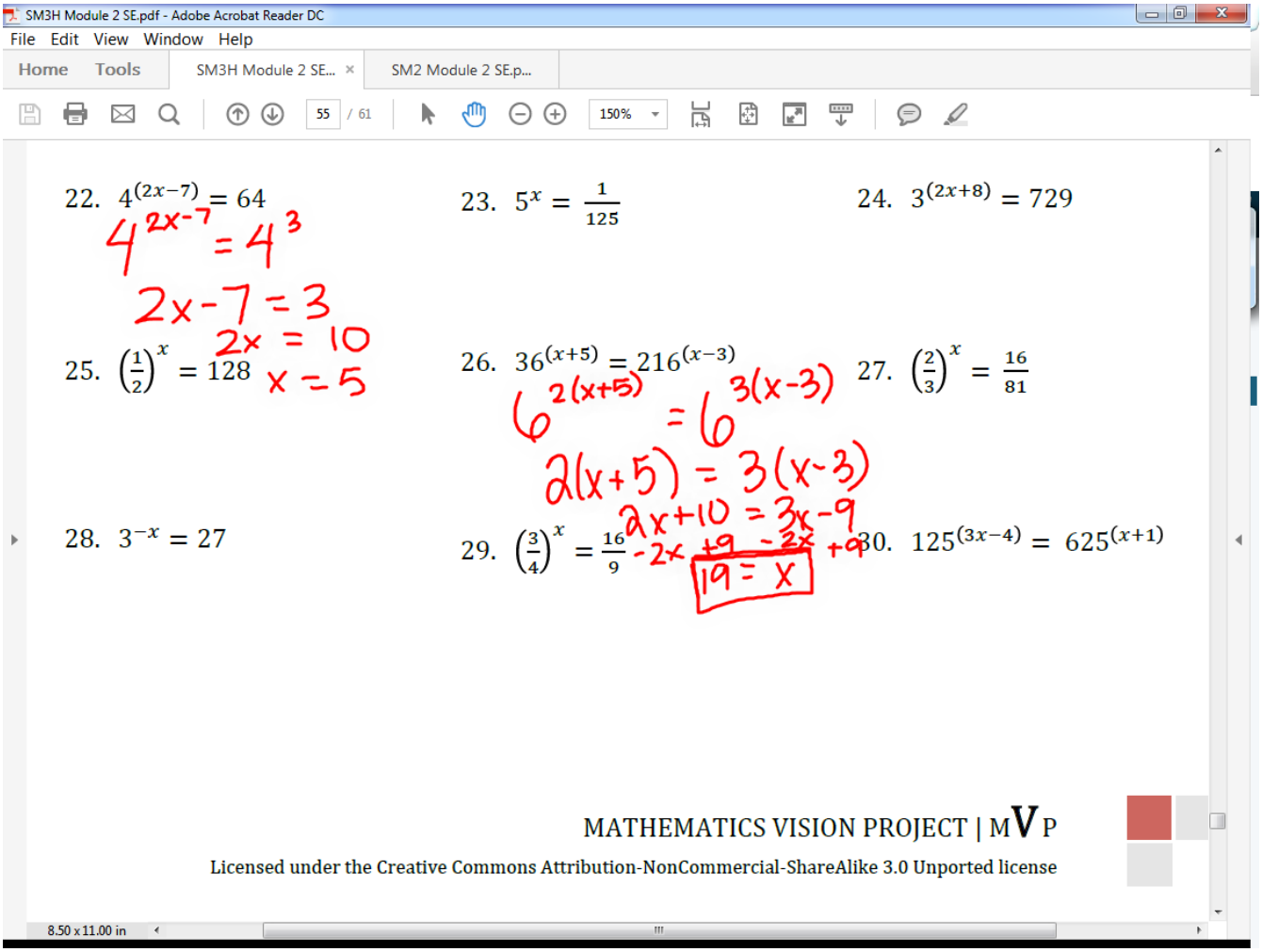
Oct 5-9:37 AM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22. $4^{(2x-7)} = 64$
$4^{2x-7} = 4^3$
$2x-7=3$
$2x=10$
$x=5$
23. $5^x = \frac{1}{125}$
24. $3^{(2x+8)} = 729$
25. $\left(\frac{1}{2}\right)^x = 128$
26. $36^{(x+5)} = 216^{(x-3)}$
$6^{2(x+5)} = 6^{3(x-3)}$
$2(x+5) = 3(x-3)$
$2x+10 = 3x-9$
$-2x \quad -2x$
$+9 \quad +9$
$19 = x$
27. $\left(\frac{2}{3}\right)^x = \frac{16}{81}$
28. $3^{-x} = 27$
29. $\left(\frac{3}{4}\right)^x = \frac{16}{9}$
30. $125^{(3x-4)} = 625^{(x+1)}$
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8.50 x 11.00 in

Logarithms Quiz #4: Growth and Decay

We begin with 1000 bacteria at t = 0, and they grow at a rate of 5% each day. Set up an equation and answer the following questions.

1) How many bacteria will there be on day 10?

2) How many days will it take the bacteria to reach 1500?

Oct 5-8:21 AM

2.8H Choose This, Not That

A Solidify Understanding Task

In each of the following equations, you are given two options for the next step. Your job is to pick the most productive of the two options, solve the equation and check your solution to be sure that you made the right choice. When you are finished, go back and explain why the option that you did not choose was either wrong or unproductive.

1. $\log 2x = 3$

Option 1: $2x = \log 3$ Option 2: $10^3 = 2x$

$\frac{1000}{2} = \frac{2x}{2}$

$500 = x$

Solution: $x = 500$ Check: $\log(2 \cdot 500) = 3$

$\log(1000) = 3$

$3 = 3$ ✓

Why I didn't select Option 1: Option 2 was nicer to work with.

2. $\ln(x + 3) = 2$

Option 1: $\ln x + \ln 3 = 2$ Option 2: $e^2 = x + 3$

Solution: 4.4 Check:

Why I didn't select Option ____:

3. $\log_3(2x + 1) = 2$

Option 1: $3^{2x+1} = 3^2$ not correct Option 2: $2x + 1 = 3^2$

Solution: $x = 4$ Check:

Why I didn't select Option ____:

4. $\log_5(2x-7) = \log_5 3$

Option 1: $2x-7=3$ Option 2: $5^3 = 2x-7$

Solution: $x = 5$ Check:

Why I didn't select Option ____:

5. $2\log_3 x = \log_3 4$

Option 1: $2x = 4$ Option 2: $\log_3 x^2 = \log_3 4$

$x^2 = 4$

$x = 2$

Solution: $x = 2$ Check:

Why I didn't select Option ____:

6. $3\ln x = \ln 16 + \ln 4$

Option 1: $\ln x^3 = \ln(16 \cdot 4)$ Option 2: $3x = 16+4$

$\ln x^3 = \ln 64$

$\sqrt[3]{x^3} = \sqrt[3]{64}$

$x = 4$

Solution: $x = 4$ Check:

Why I didn't select Option ____:

7. $\log_2 2x - \log_2(x-2) = \log_2 3$

Option 1: $\log_2\left(\frac{2x}{x-2}\right) = \log_2 3$ Option 2: incorrect $\frac{\log_2 2x}{\log_2(x-2)} = \log_2 3$

$(x-2)\frac{2x}{(x-2)} = 3(x-2)$

Solution: Check:

$2x = 3x - 6$

Why I didn't select Option ____: $-2x \quad -2x$

$+6 \quad +6$

$6 = x$

8. $-2 = \log_x \frac{1}{9}$

Option 1: $x^{-2} = \frac{1}{9}$

$\frac{1}{x^2} = \frac{1}{9}$

$x^2 = 9$

$x = 3$

Solution:

Why I didn't select Option ____:

Option 2: $-2 = \log_x 1 - \log_x 9$

$-2 = -\log_x 9$

$2 = \log_x 9$

$x^2 = 9 \rightarrow x = 3$

Check:

9. $x = \log_3 10$

Option 1: $x^3 = 10$

Option 2: $3^x = 10$

$\log_3 10 = x$

$\approx x$

Solution:

Why I didn't select Option ____:

Check:

10. $\log_a(x^2 + 1) + 2\log_a 4 = \log_a 40x$

Option 1: $\log_a 16(x^2 + 1) = \log_a 40x$

$16x^2 + 16 = 40x$

$16x^2 - 40x + 16 = 0$

$8(2x^2 - 5x + 2) = 0$

$8((2x^2 - 4x) + (x + 2)) = 0$

$8[2x(x-2) - 1(x-2)] = 0$

$8[(x-2)(2x-1)] = 0$

$8(x-2)(2x-1) = 0$

Solution:

Why I didn't select Option ____:

Check:

Option 2: $\log_a 8(x^2 + 1) = \log_a 40x$

a.c

4

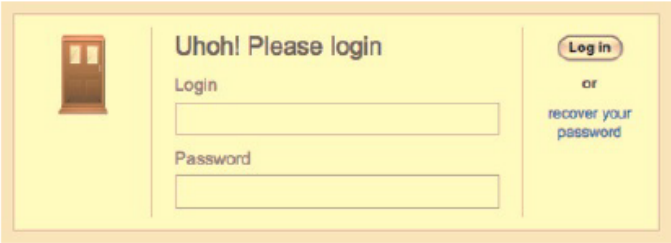
-4x -1x

-5

b

2.9H Don't Forget Your *Log*in

A Practice Understanding Task



Solve each of the following equations. When you have finished, sort the equations into categories based upon the strategy you used to solve them. Name each category and then describe how to solve equations in this category.

1. $\log 3x = 2$

2. $-3 = \log_x \frac{1}{125}$

3. The rate at which caffeine is eliminated from the bloodstream of an average adult is about 15% per hour. If the peak level of caffeine in the bloodstream is 30 milligrams, the amount of caffeine left in the bloodstream t hours after the caffeine reaches its peak level can be modeled by the function: $C(t) = 30(0.85)^t$. After how many hours will there be 15 mg left in the bloodstream?

4. $x = \log_5 100$

5. $\ln(5x - 3) + \ln 2 = \ln(24 - 2x)$

6. $\log_5(4x - 3) = \log_5 29$

7. The Richter scale, which measures the magnitude of earthquakes is a logarithmic scale, where the magnitude of the earthquake, M depends on the energy released by the earthquake E. In 1994, an earthquake of magnitude 6.6 on the Richter scale injured thousands of people and cost billions of dollars in damages. That earthquake could be modeled with the equation: $6.6 = \frac{2}{3}\log\left(\frac{E}{10^{11.8}}\right)$. Find the energy released by the earthquake.

8. $\log_5(3x + 1) = 2$

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9. $\log_b x^3 = \log_b 27$

10. Ever wonder why suddenly your kitchen is full of fruit flies? Given good conditions, fruit fly populations can grow at the amazing rate of 28% per day. If 25 fruit flies enter your house to hang out on a piece of ripe fruit, the fly population after t days can be modeled as: $P(t) = 25(1.28)^t$. How long will it take for you to have 100 little fruit flies buzzing around?

11. $\log_x 5 = \frac{1}{4}$

12. $3^x = 5^{2.3}$

13. $\log_2 2x - \log_2(x-2) = \log_2 3$

14. $\log_3 2x = \log_3(x-1)$

15. $\ln(x-1) = 3$

16. $\log(x^2-2) + 2\log 6 = \log 6x$

17. $x = \log_3 10$

18. $2\log_a x + \log_a 2 = \log_a(5x+3)$

19. $3 + 7^{3x+1} = 346$

Homework

Finish 2.9H "Ready, Set, Go"

Mar 28-11:26 AM