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: $10^3 = 2x$

Solution: Check:

Why I didn't select Option ____:

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

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

Solution: Check:

Why I didn't select Option ____:

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

Option 1: $3^{2x+1} = 3^2$ Option 2: $2x+1 = 3^2$

Solution: 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: Check:

Why I didn't select Option ____:

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

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

Solution: 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: $3x = 16 + 4$

Solution: 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: $\frac{\log_2 2x}{\log_2(x-2)} = \log_2 3$

Solution:

Check:

Why I didn't select Option ____:

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

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

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

Solution:

Check:

Why I didn't select Option ____:

9. $x = \log_3 10$

Option 1: $x^3 = 10$

Option 2: $3^x = 10$

Solution:

Check:

Why I didn't select Option ____:

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

Option 1: $\log_a 16(x^2+1) = \log_a 40x$ Option 2: $\log_a 8(x^2+1) = \log_a 40x$

Solution: Check:

Why I didn't select Option ____:

2.8H

READY, SET, GO! Name Period Date

READY

Topic: Evaluating functions

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

Three possible solutions are given for each equation. Determine which solution is correct. Justify your answers.

9. $log\ 5x = 3$
   a. $x = 3 - log\ 5$
   b. $x = 200$
   c. $x = \frac{3}{5}$
10. $log\ (x + 28) = 2$
    a. $x = 72$
    b. $x = 2 - log 28$
    c. $x = \frac{100}{28}$
11. $log_3(2x + 1) = 2$
    a. $x = \frac{1}{2}$
    b. $x = \frac{5}{2}$
    c. $x = 4$
12. $log_5(3x - 8) = log_5 13$
    a. $x = 7$
    b. $x = \frac{5^{13}+8}{3}$
    c. $x = \frac{104}{3}$
13. $3logx = log\ 16 + log 4$
    a. $x = \frac{20}{3}$
    b. $x = 4$
    c. $x = \sqrt[3]{10^{20}}$
14. $log_2 2x - log_2(x - 2) = log_2 3$
    a. $x = 6$
    b. $x = 3$
    c. $x = -6$
15. $-3 = log_x\left(\frac{1}{8}\right)$
    a. $x = -2$
    b. $x = 2$
    c. $x = 4$
16. $x = \log_3 15$
    a. $x = \sqrt[3]{15}$
    b. $x = 5$
    c. $x \approx 2.465$
17. $\log_a(x - 7) = 0$
    a. $x = 7$
    b. $x = 8$
    c. *no solution*

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Circle the expressions that are equal. Explain why they are equal.

18. $log_5\sqrt{50}$, $log_5 25$, $1 + log_5\sqrt{2}$

19. $\frac{log_2 32}{log_2 4}$, $log_2 \frac{32}{4}$, $log_2 32 - log_2 4$

20. $log\sqrt{90}$, $log 3 + \frac{1}{2}$, $\frac{1}{2} log 2 + \log 45$

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. $3^{(2x+8)} = 729$

25. $\left(\frac{1}{2}\right)^x = 128$

26. $36^{(x+5)} = 216^{(x-3)}$

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. $125^{(3x-4)} = 625^{(x+1)}$