

Algebra 2 Assignment 44

NEW

Complete the Log Monster!

1. $\log_4 64 = 3 \rightarrow 4^3 = 64$

2. $\log_7 \left(\frac{1}{49}\right) = -2 \rightarrow 7^{-2} = \frac{1}{49}$

3. $\log_{16} (8) = \frac{3}{4} \rightarrow 16^{\frac{3}{4}} = 8$

4. $\ln 20.086 = 3 \rightarrow \log_e 20.086 = 3 \rightarrow e^3 = 20.086$

5. $5^3 = 125 \rightarrow \log_5 (125) = 3$

6. $8^2 = 64 \rightarrow \log_8 64 = 2$

7. $e^7 = 1096.633 \rightarrow \ln 1096.633 = 7$

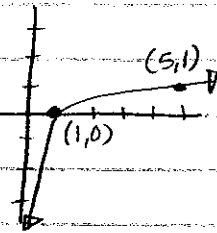
Graph the following:

8. $f(x) = \log_5 x$

$(1, 0)$

$(5, 1)$

VA: $x=0$

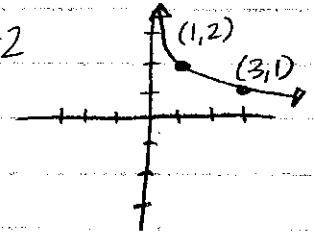


9. $g(x) = -\log_3 x + 2$

$(1, 0) \rightarrow (1, 2)$

$(3, 1) \rightarrow (3, 1)$

VA: $x=0$

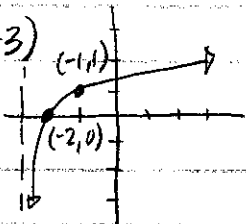


10. $y = \log_2(x+3)$

$(1, 0) \rightarrow (-2, 0)$

$(2, 1) \rightarrow (-1, 1)$

VA: $x=-3$

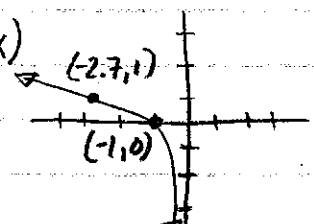


11. $h(x) = \ln(-x)$

$(-1, 0)$

$(-2.7, 1)$

VA: $x=0$

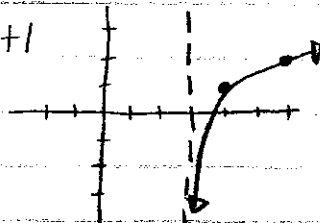


12. $y = \ln(x-3) + 1$

$(1, 0) \rightarrow (4, 1)$

$(2.7, 1) \rightarrow (5.7, 2)$

VA: $x=3$



13. $\log_{10} 345 = 2.538$

14. $\log_2 (1/5) = -0.97$

15. $\ln 32 = 3.466$

REVIEW

16. $\frac{(3y^{-2})^2 y x y^{-2}}{y^0 x x^2 x^3 (x^{-1})^2} = \frac{9y^{-4} y x y^{-2}}{1x^6 x^2} = \frac{9xy^{-4}}{x^4} = \frac{9}{x^3 y^4}$

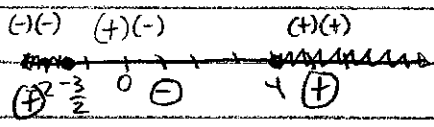
17. $27^{2/3} = (\sqrt[3]{27})^2 = 3^2 = 9$

18. $2x^2 \geq 5x + 12$

$2x^2 - 5x - 12 \geq 0$

$(2x+3)(x-4) \geq 0$

$x = -3/2 \quad x = 4$



$x \leq -3/2 \text{ or } x \geq 4$

19. $f(x) = 2x^2 - 5x + 8$

$g(x) = \frac{x-8}{3}$

$(f \circ g)(-4) = 2(-\frac{4-8}{3})^2 - 5(-\frac{4-8}{3}) + 8$

$= 2(-4)^2 - 5(-4) + 8 = 2(16) + 20 + 8 = 60$

$(g \circ f)(-4) = \frac{2(-4)^2 - 5(-4) + 8 - 8}{3} = \frac{60 - 8}{3} = \frac{52}{3}$

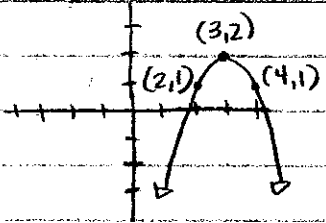
20. $g(x) = x^2 - 7$

$h(x) = 3x + 2$

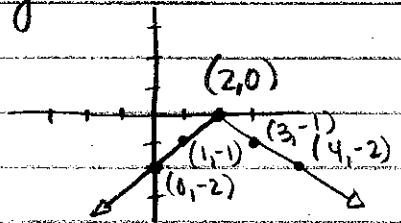
$g(h(x)) = (3x+2)^2 - 7 = 9x^2 + 12x + 4 - 7 = 9x^2 + 12x - 3$

$h(g(x)) = 3(x^2 - 7) + 2 = 3x^2 - 21 + 2 = 3x^2 - 19$

21. $f(x) = -(x-3)^2 + 2$



22. $y = -|x-2|$



23. $g(x) = \sqrt{x-2}$

$x = \sqrt{y-2}$

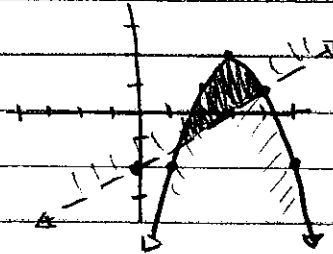
$x^2 = y - 2$

$x^2 + 2 = y$

$g^{-1}(x) = x^2 + 2$

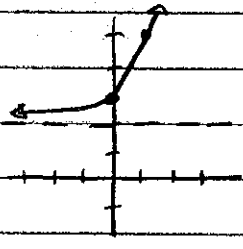
Asmt 44-continued

24. $y \leq -(x-3)^2 + 2$
 $y > \frac{3}{4}x - 2$



25. $f(x) = 3^x + 2$

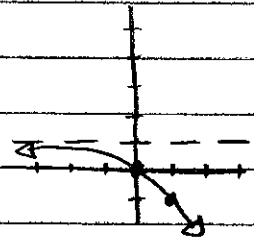
$(0,1) \rightarrow (0,3)$
 $(1,3) \rightarrow (1,5)$



HA: $y=2$

26. $y = -2^x + 1$

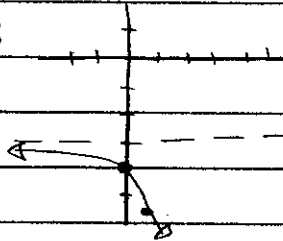
$(0,-1) \rightarrow (0,0)$
 $(1,-2) \rightarrow (1,-1)$



HA: $y=1$

27. $f(x) = -e^x - 3$

$(0,1) \rightarrow (0,4)$
 $(1,2) \rightarrow (1,-5)$



HA: $y=-3$

28. $x+y=4 \rightarrow y=-x+4$
 $x^2-y=2 \rightarrow x^2-2=y$

$(-3,7), (2,2)$

29. $y = 3|x-4| + 1$
 $y = x - 2$

$(3.75, 1.75), (4.5, 2.5)$

30. $y = pe^{rt}$ $y = 5000 e^{((.075)(20))} = \$22,408.45$

31. $15,000 = pe^{((.055)(20))} \rightarrow p = \frac{15000}{e^{(1.1)}} = \4993.07

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10. $y = a(x-0)^2 + 0$
 at $(1,-2)$ $-2 = a(1-0)^2$ $a = -2$

$y = -2x^2$

20. $f(x) = 3x^2 - 18x + 11$
 $h = \frac{-18}{6} = -3$, $k = 3(9) - 18(3) + 11 = 27 - 54 + 11 = -16$

$f(x) = 3(x-3)^2 - 16$
 vertex: $(3,-16)$, opens up

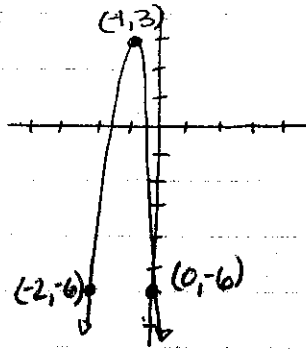
34. $y = a(x+3)^2 - 2$

at $(-1, 8)$ $8 = a(-1+3)^2 - 2 \rightarrow 10 = a(4) \rightarrow a = \frac{10}{4} = \frac{5}{2}$

$y = \frac{5}{2}(x+3)^2 - 2$

48. $f(x) = -9x^2 - 18x - 6$

$h = \frac{-b}{2a} = -1$ $k = -9 + 18 - 6 = 3$



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16. $\{(-1, -2), (-3, -2), (-1, -4), (0, 6)\}$

Inverse: $\{(-2, -1), (-2, -3), (-4, -1), (6, 0)\}$
not a function

18. $\{(6, 11), (-2, 7), (0, 3), (-5, 3)\}$

Inverse: $\{(11, 6), (7, -2), (3, 0), (3, -5)\}$
not a function

34. $f(x) = \frac{x-1}{2}$
 $g(x) = 2x+1$

$f(g(x)) = \frac{(2x+1)-1}{2} = \frac{2x}{2} = x$

$g(f(x)) = 2\left(\frac{x-1}{2}\right) + 1 = x - 1 + 1 = x$

yes, they are inverses.