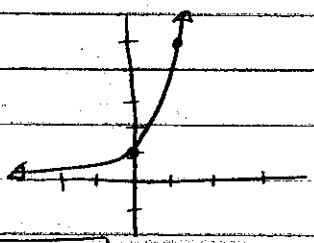
38 problems

Algebra 2 ~ Assignment 43 Key

1. $f(x) = 5^x$

(0,1)

(1,5)

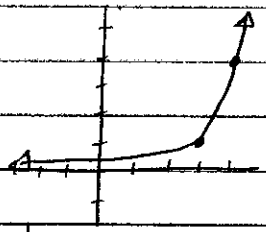


HA: $y=0$

2. $g(x) = 4^{x-3}$

$(0,1) \to (3,1)$

$(1,4) \to (4,4)$

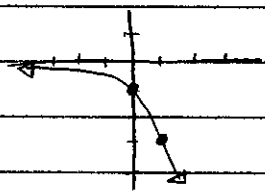


HA: $y=0$

3. $y = -3^x$

(0,-1)

(1,-3)

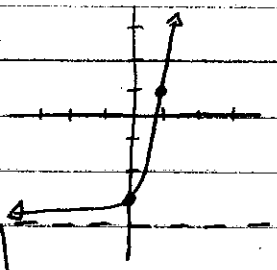


HA: $y=0$

4. $h(x) = 5^x - 4$

$(0,1) \to (0,-3)$

$(1,5) \to (1,1)$

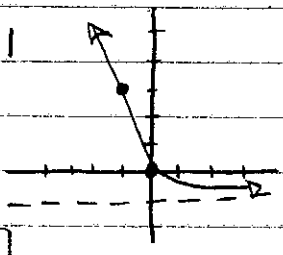


HA: $y=-4$

5. $f(x) = 4^{-x} - 1$

$(0,1) \to (0,0)$

$(-1,4) \to (-1,3)$



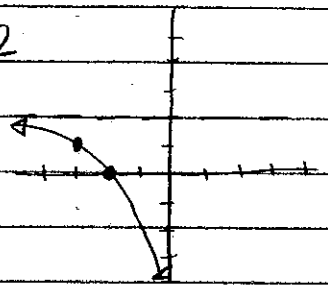
HA: $y=-1$

6. $y = -2^{x+3} + 2$

$-3 \quad +2$

$(0,1) \to (-3,1)$

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

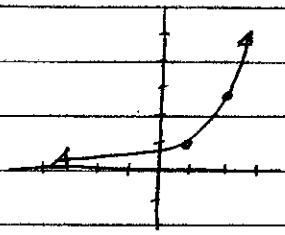


HA: $y=2$

7. $y = e^{x-1}$

$(0,1) \to (1,1)$

~~$(1,2.7) \to (2,2.7)$~~

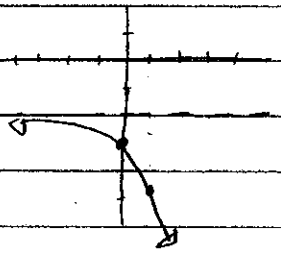


HA: $y=0$

8. $f(x) = -e^x - 2$

$(0,1) \to (0,-3)$

~~$(1,2.7) \to (1,-4.7)$~~

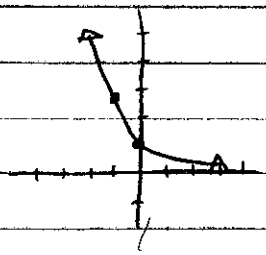


HA: $y=-2$

9. $g(x) = e^{-x}$

$(0,1) \to (0,1)$

$(1,2.7) \to (-1,2.7)$



HA: $y=0$

10. $e^{3.2} =$ 24.533

11. $e^{-2.5} =$ .082

12. $e^{1/2} =$ 1.649

13. $y = pe^{rt}$

$y = 25{,}000\,e^{(.0875)(25)} = \boxed{\$222{,}822.57}$

14. $y = 2000e^{(.05)(18)} = \boxed{\$4919.21}$

15. $10000 = pe^{(.075)(18)} \rightarrow p = 10000/e^{(.075)(18)} = \boxed{\$2592.40}$

REVIEW

16. Solve: $\sqrt{K+9} - \sqrt{K} = \sqrt{3}$

$\sqrt{K+9}^2 = (\sqrt{3} + \sqrt{K})^2 (\sqrt{3} + \sqrt{K})$

$K + 9 = 3 + \sqrt{3K} + \sqrt{3K} + K$

$-K \quad -3 \quad -3 \quad -K$

$\frac{6}{2} = \frac{2\sqrt{3K}}{2}$

$3^2 = \sqrt{3K}^2$

$\frac{9}{3} = \frac{3K}{3}$

$\boxed{3 = K}$

17. $x = 7, -6 \quad (x-7)(x+6) = 0$

$x^2 + 6x - 7x - 42 = 0$

$\boxed{x^2 - x - 42 = 0}$

18. $\frac{6^{(a)}}{(a-7)a} = \frac{a-49}{a^2-7a} + \frac{1^{(a-7)}}{a(a-7)} \rightarrow 6a = a - 49 + a - 7$

$6a = 2a - 56$

$-2a \quad -2a$

$\frac{4a}{4} = \frac{-56}{4} \rightarrow \boxed{a = -14}$

19. $f(x) = x^2 - 3x + 7$

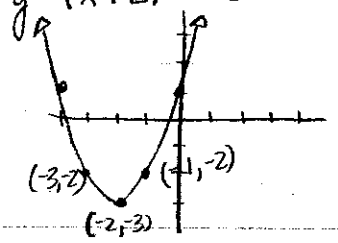
$g(x) = x + 4$

$f(g(x)) = (x+4)^2 - 3(x+4) + 7$

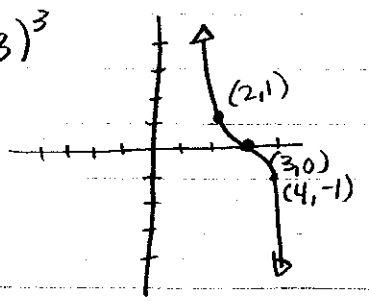
$= x^2 + 8x + 16 - 3x - 12 + 7 = \boxed{x^2 + 5x + 11}$

$g(f(x)) = (x^2 - 3x + 7) + 4 = \boxed{x^2 - 3x + 11}$

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



21. $y = -(x-3)^3$

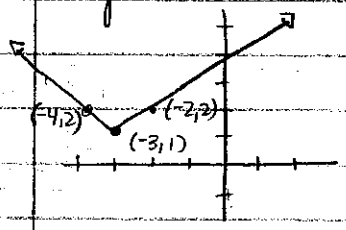


REINFOR

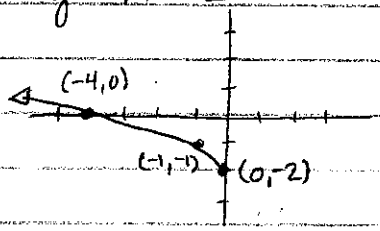
Asmt 43 - continued

REINFORCED

22. $y = |x+3| + 1$



23. $y = \sqrt{-x} - 2$

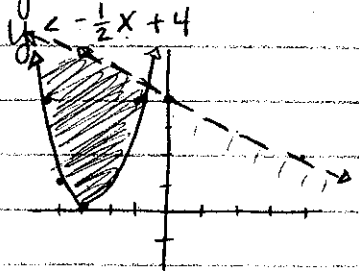


24. $f(x) = x^3 + 1$ $\quad x = y^3 + 1 \rightarrow x - 1 = y^3 \rightarrow \sqrt[3]{x-1} = y$ $\quad \boxed{f^{-1}(x) = \sqrt[3]{x-1}}$

REINFORCED

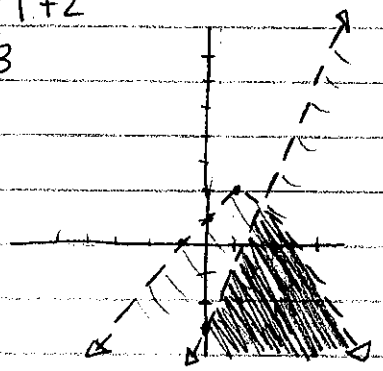
25. $y \geq (x+3)^2$

$y < -\frac{1}{2}x + 4$



26. $y < -|x-1| + 2$

$y < 2x - 3$



REINFORCED

27. $f(x) = |x+5| - 7$ $\quad \boxed{\text{Domain: } \mathbb{R} \quad \text{Range: } y \geq 7}$

28. $f(x) = \sqrt{16 - x^2}$ $\quad \boxed{\text{not one-to-one}}$

29. $g(x) = (x+5)^3$ $\quad \boxed{\text{one-to one}}$

REINFORCED

30. Solve: $3x - y = -2 \rightarrow 3x = y - 2 \rightarrow 3x + 2 = y$

$2x^2 - y = 0 \rightarrow 2x^2 = y$

$\boxed{(-.5, .5) \quad (2, 8)}$

REINFORCED

BOOK: p373

22. $f(x) = x^2 + 6x - 3$

$h = -6/2 = -3 \quad K = (-3)^2 + 6(-3) - 3 = 9 - 18 - 3 = -12$

$\boxed{f(x) = (x+3)^2 - 12 \quad \text{vertex: } (-3, -12), \text{ opens up}}$

24. $f(x) = 4x^2 + 24x$

$h = \frac{-24}{8} = -3 \quad K = 4(-3)^2 + 24(-3) = 36 - 72 = -36$

$f(x) = 4(x+3)^2 - 36$

vertex $(-3, -36)$, opens up

28. $f(x) = -\frac{1}{2}x^2 + 5x - \frac{27}{2}$

$h = \frac{-5}{2(-\frac{1}{2})} = +5 \quad K = -\frac{25}{2} + \frac{50}{2} - \frac{27}{2} = \frac{-2}{2} = -1$

$f(x) = -\frac{1}{2}(x-5)^2 - 1$

vertex: $(5, -1)$ opens down

30. $y = a(x-2)^2 + 0$

at $(1,4) \quad 4 = a(1-2)^2 \rightarrow 4 = a$

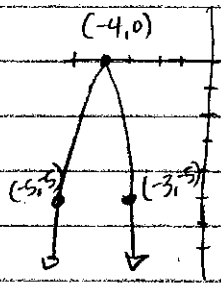
$y = 4(x-2)^2$

46. $f(x) = -5x^2 - 40x - 80$

$h = \frac{40}{-10} = -4 \quad K = -5(16) - 40(-4) - 80$

$= -80 + 160 - 80 = 0$

Vertex: $(-4, 0)$



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8. $\{(3,8), (4,-2), (5,-3)\}$

Inverse: $\{(8,3), (-2,4), (-3,5)\}$ Function

32. $g(x) = 2x - 3 \quad g(h(x)) = 2(-2x+3) - 3 = -4x + 6 - 3 = -4x + 3 \neq x$

$h(x) = -2x + 3$

Not inverses

49. $\{(9,0), (3,1), (12,7), (1,-4), (12,8), (-11,-3), (0,-6)\}$

Domain: $\{9, 3, 12, 1, -11, 0\}$

Range: $\{0, 1, 7, -4, 8, -3, -6\}$

Not a function.