1.6 - 1.10 Review

Pg. 106 - 108 #67, 68, 70-78, 81, 83, 87-90, 93, 95-99

67) $f(2) = -6$ $f(-1) = 3$

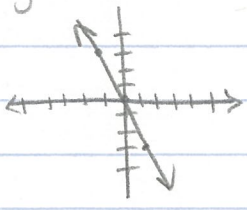
$(2, -6)$ $(-1, 3)$

$m = \frac{-6-3}{2+1} = \frac{-9}{3} = -3$

$y + 6 = -3(x-2)$

$y = -3x + 6 - 6$

$y = -3x$



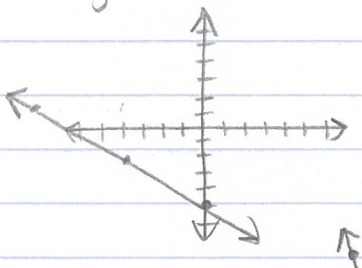
68) $f(0) = -5$ $f(4) = -8$

$(0, -5)$ $(4, -8)$

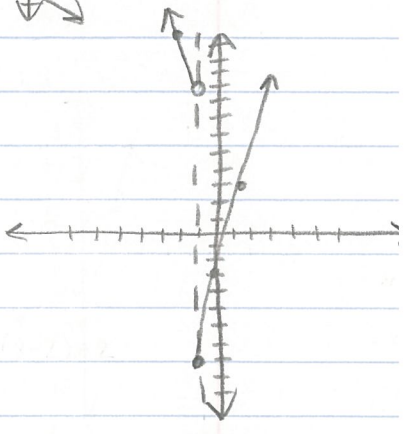
$m = \frac{-5+8}{0-4} = \frac{-3}{4}$

$y + 5 = -3/4(x - 0)$

$y = -3/4x - 5$



70) $f(x) = \begin{cases} 5x - 3, & x \geq -1 \\ -4x + 5, & x < -1 \end{cases}$

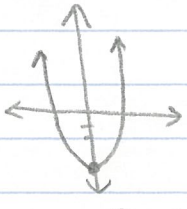


71) $h(x) = x^2 - 9$

a) quadratic - squaring $f(x) = x^2$

b) down 9

c)



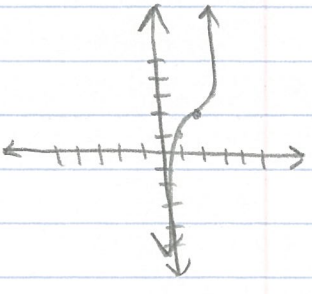
d) $h(x) = f(x) - 9$

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

a) cubic $f(x) = x^3$

b) right 2 up 2

c)



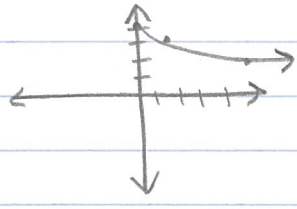
d) $h(x) = f(x-2) + 2$

73) $h(x) = -\sqrt{x} + 4$

a) square root $f(x) = \sqrt{x}$

b) reflect x-axis up 4

c)



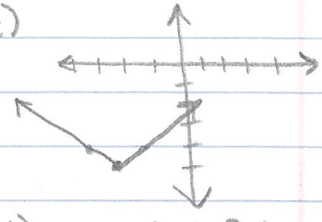
d) $h(x) = -f(x) + 4$

74) $h(x) = |x+3| - 5$

a) absolute value $f(x) = |x$

b) left 3 down 5

c)



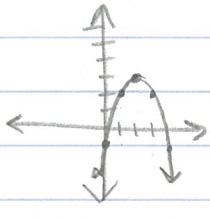
d) $h(x) = f(x+3) - 5$

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

a) quadratic - squaring $f(x) = x^2$

b) reflect x-axis, left 2, up 3

c)



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

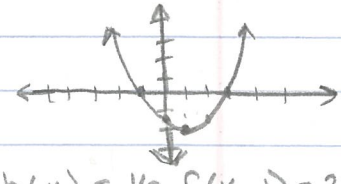
76) $h(x) = \frac{1}{2}(x-1)^2 - 2$

a) quadratic-squaring $f(x$

b) vertical stretch by $\frac{1}{2}$

right 1, down 2

c)



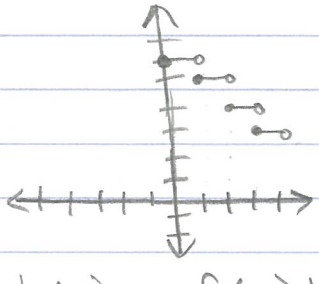
d) $h(x) = \frac{1}{2} f(x-1) - 2$

77) $h(x) = -[\![x]\!] + 6$

a) step - greatest integer $f(x) = [\![x]\!]$

b) reflect x-axis, up 6

c)



d) $h(x) = -f(x) + 6$

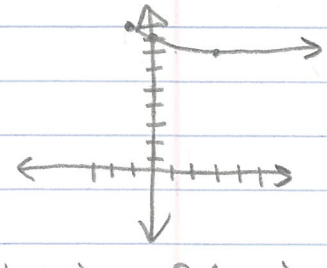
78) $h(x) = -\sqrt{x+1} + 9$

a) square root $f(x) =$

b) reflect x-axis,

left 1, up 9

c)



d) $h(x) = -f(x+1) +$

81) $f(x) = x^2+3 \quad g(x) = 3x+1$

a) $x^2+3+3x+1$

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

b) $x^2+3-(3x+1)$

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

c) $(x^2+3)(3x+1)$

$(fg)(x) = 3x^3+x^2+9x+3$

d) $(f \circ g)(x) = f(3x+1)$

$= (3x+1)^2+3$

$= 9x^2+6x+1+3$

$= 9x^2+6x+4$

Domain: $\mathbb{R}$

83) $f(x) = \frac{1}{3}x-3 \quad g(x) = 3x+1$

a) $f(g(x)) =$

$f(3x+1) = \frac{1}{3}(3x+1)-3$

$= x+\frac{1}{3}-3$

$= x-\frac{8}{3}$

D: $\mathbb{R}$

b) $g(f(x)) =$

$g(\frac{1}{3}x-3) = 3(\frac{1}{3}x-3)$

$= x-9+1$

$= x-8$

D: $\mathbb{R}$

87) $f(x) = 3x+8$

$x = 3y+8$

$\frac{x-8}{3} = y$

$f^{-1}(x) = \frac{1}{3}x-\frac{8}{3}$

88) $f(x) = \frac{x-4}{5}$

$x = \frac{y-4}{5}$

$5x+4 = y$

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

★ $f(f^{-1}(x)) =$

$f(\frac{1}{3}x-\frac{8}{3}) = 3(\frac{1}{3}x-\frac{8}{3})+8$

$= x-8+8$

$= x$

★ $f(f^{-1}(x)) =$

$f(5x+4) = \frac{5x+4-4}{5}$

$= \frac{5x}{5} = x$

★ $f^{-1}(f(x)) =$

$f^{-1}(3x+8) = \frac{1}{3}(3x+8)-\frac{8}{3}$

$= x+\frac{8}{3}-\frac{8}{3}$

$= x$

★ $f^{-1}(f(x)) =$

$f^{-1}(\frac{x-4}{5}) = \cancel{5}\left(\frac{x-4}{\cancel{5}}\right)+4$

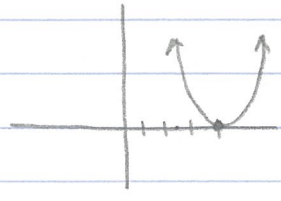
$= x-4+4$

$= x$

89) $f(x) = (x-1)^2$ NO

90) $h(t) = \dfrac{2}{t-3}$ yes

93) $f(x) = 2(x-4)^2$



restrict domain

$x > 4$

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

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

$\dfrac{x}{2} = (y-4)^2$

$\sqrt{\dfrac{x}{2}} = y-4$

$f^{-1}(x) = \sqrt{\dfrac{x}{2}} + 4$, x

95)

a) enter data in calculator

b) $y = 135.58 - 5.02x$ or $y = -5.02x + 135.6$

fits well

96) $T = \dfrac{K}{S}$ $\quad 3 = \dfrac{K}{65}$ $\quad K = 195$

$T = \dfrac{195}{S} \Rightarrow T = \dfrac{195}{80} = 2.4375$ or 2 hrs 26 min

97) $C = K(H)(W)^2$ $\quad 28.80 = K(16)(6)^2$

$K = .05$

$C = .05(H)(W)^2 \Rightarrow C = .05(14)(8)^2 = \$44.80$

98) False, reflected in x-axis, left 9, and then down 13

Remember order matters (This particular problem you get the same answe both ways)

99) True