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CHAPTER 1: FUNCTIONS
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1.1 Functions and Function Notation
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Two from 21-34 pg. 17

Evaluate for (-2, -1, 0, 1, 2)

21.) $f(x) = 4 - 2x$

$$f(-2) = 4 - 2(-2) \rightarrow f(-2) = 4 + 4 = \mathbf{8}$$

$$f(-1) = 4 - 2(-1) \rightarrow f(-1) = 4 + 2 = \mathbf{6}$$

$$f(0) = 4 - 2(0) \rightarrow f(0) = 4 + 0 = \mathbf{4}$$

$$f(1) = 4 - 2(1) \rightarrow f(1) = 4 - 2 = \mathbf{2}$$

$$f(2) = 4 - 2(2) \rightarrow f(1) = 4 - 4 = \mathbf{0}$$

22.) $f(x) = 8 - 3x$

$$f(-2) = 8 - 3(-2) \rightarrow f(-2) = 8 + 6 = \mathbf{14}$$

$$f(-1) = 8 - 3(-1) \rightarrow f(-1) = 8 + 3 = \mathbf{11}$$

$$f(0) = 8 - 3(0) \rightarrow f(0) = 8 + 0 = \mathbf{8}$$

$$f(1) = 8 - 3(1) \rightarrow f(1) = 8 - 3 = \mathbf{5}$$

$$f(2) = 8 - 3(2) \rightarrow f(2) = 8 - 6 = \mathbf{2}$$

One from 35-38 pg. 18

37.) Let $f(t) = 3t + 5$

a. Evaluate $f(0)$

$$f(0) = 3(0) + 5 \quad f(0) = 0 + 5 = \mathbf{5}$$

b. $f(t) = 0$

$$0 = 3t + 5$$

$$-5 = 3t \quad t = \frac{5}{3}$$

One from 43-44 pg. 19

43.) A circle centered at (3,-9) with a radius of 6

$$(x - 3)^2 + (y + 9)^2 = 6^2$$

$$x^2 - 3x - 3x + 9 + y^2 + 9y + 9y + 18 = 36$$

$$x^2 - 6x + 27 + y^2 + 18y = 36$$

$$x^2 + y^2 - 6x + 18y + 27 = 36$$

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Section 1.2 Domain and Range

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One from 7-18 pg. 34

$$7.) f(x) = 3\sqrt{x-2}$$

$$\sqrt{x-2}$$

$$x - 2 \rightarrow x \leq 2$$

One from 19-24 pg. 34

Evaluate for f(-1) f(0) f(2) f(4)

$$19.) f(x) = \begin{cases} 7x+3 & \text{if } x < 0 \\ 7x+6 & \text{if } x \geq 0 \end{cases}$$

$$7(-1) + 3 = -4 \quad 7(-1) + 6 = -1$$

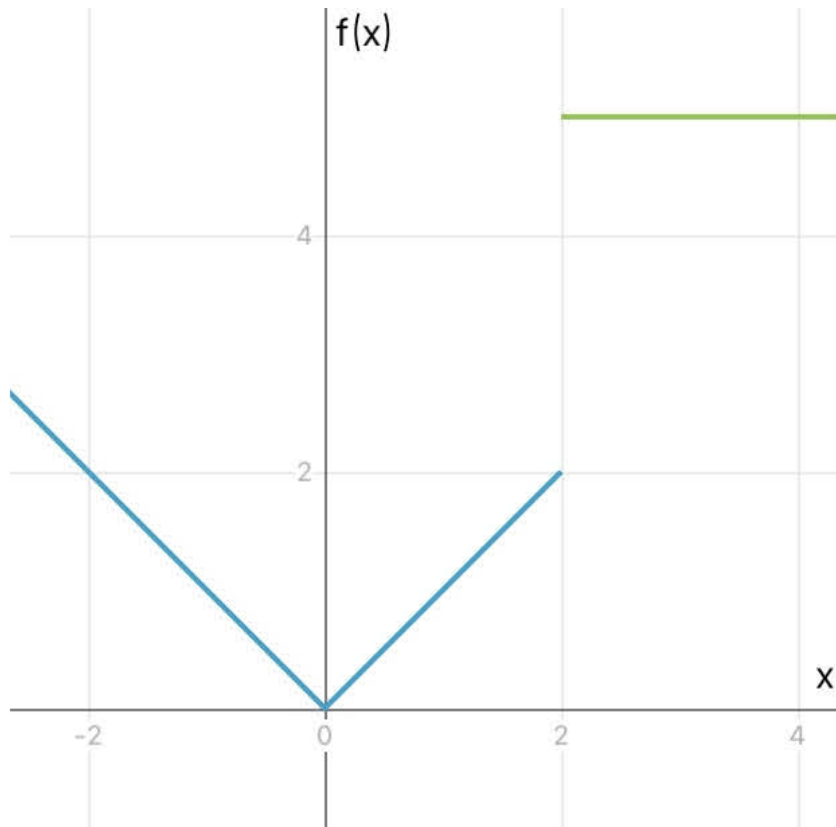
$$7(0) + 3 = 3 \quad 7(0) + 6 = 6$$

$$7(2) + 3 = 17 \quad 7(2) + 6 = 20$$

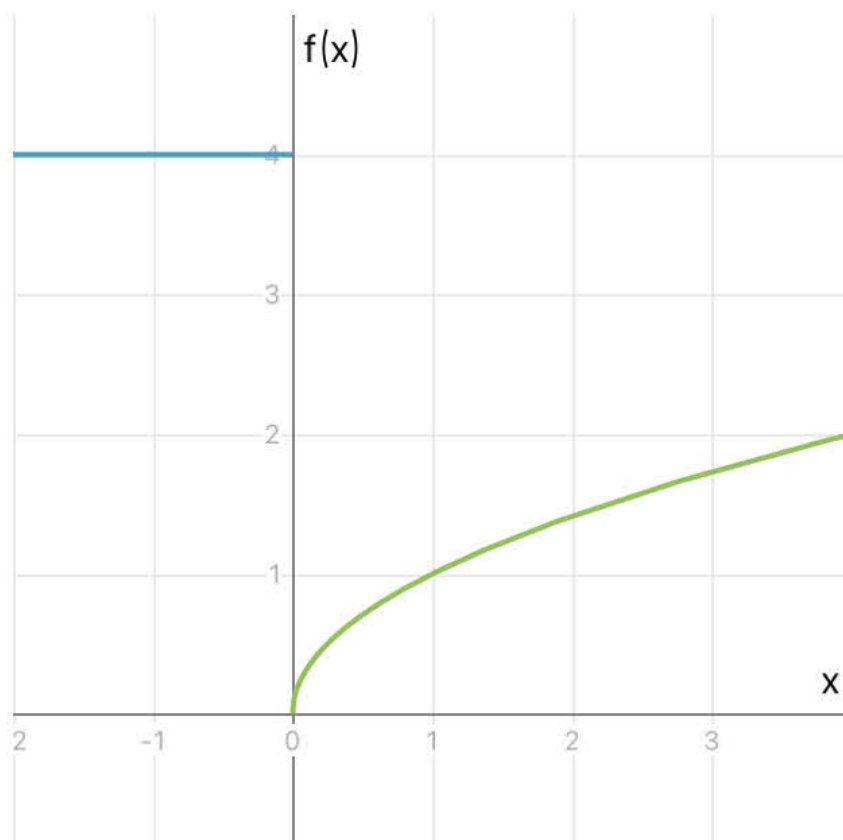
$$7(4) + 3 = 31 \quad 7(4) + 6 = 34$$

Two from 31-36 pg. 35

$$31.) f(x) = |x| \text{ if } x < 2, \quad 5 \text{ if } x \geq 2$$



32.) $f(x) = 4i f x < 0, \sqrt{x} i f \geq 0$



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Section 1.3 Rates of Change and Behavior of Graphs

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Two from 5-10 pg. 48

5.) $f(x) = x^2$ on $[1, 5]$

ROC: 2,6,18

6.) $q(x) = x^3$ on $[-4, 2]$

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One from 11-20 pg. 48

11.) $f(x) = 4x^2 - 7$ on $[1, b]$

ROC: (2,6,18) , $[1,18]$ $b = 18$

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One from 37-42 pg. 50

37.) $f(x) = x^4 - 4x^3 + 5$

INCREASING, CONCAVE UP

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Section 1.4 Composition of Functions

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One from 1-4 pg. 60

Calculate $f(g(0))$ and $g(f(0))$

1.) $f(x) = 4x + 8, g(x) = 7 - x^2$

$4(0) + 8(7 - 0^2) = \mathbf{56}$

$7 - 0^2(4(0) + 8) = \mathbf{7}$

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Two from 21-26 pg. 60

21.) $f(x) = \frac{1}{x-6}, g(x) = \frac{7}{x} + 6$

$f(g(x)) = x/7, g(f(x)) = 7x - 36$

22.) $f(x) = \frac{1}{x-4}, g(x) = \frac{2}{x} + 4$

$(g(x)) = x/2, g(f(x)) = 2x - 4$

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One from 27-28, 31-32 pg. 61

27.) If $f(x) = x^4 + 6, g(x) = x - 6$ and $h(x) = \sqrt{x}$, find $f(g(h(x)))$

$f(g(h(x))) = (\sqrt{x^4 - 6}) - 6$

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1.5 Transformation of Functions

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One from 11-14 pg. 85

11.) Write Formula for $f(x) = \sqrt{x}$ shifted up 1 unit and left 2 units

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

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One from 33-34 pg. 87

33.) Starting with the graph of $f(x) = 6^x$ write the equation of the graph that results from:

- a. reflecting $f(x)$ about the x-axis and the y-axis

$$f(x) = -6^{-x}$$

- b. reflecting $f(x)$ about the x-axis, shifting up 2 units, and down 3 units

$$f(x) = (-6^x + 2)$$

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One from 39-40 pg. 88

39.) For each equation below, determine if the function is Odd, Even or Neither:

a. $f(x) = 3x^4$

EVEN

b. $g(x) = \sqrt{x}$

NEITHER

c. $h(x) = \frac{1}{x} + 3x$

ODD

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One from 67-74 pg. 89

67.) $f(x) = 4(x + 1)^2 - 5$

INCREASING

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Section 1.6 Inverse Functions

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Four from 13-22 pg. 100

Find $f^{-1}(x)$

13.) $f(x) = x + 3$

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

14.) $f(x) = x + 5$

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

Find a domain on which f is a one-to-one function and non-decreasing, then find the inverse of f restricted to that domain.

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

20.) $f(x) = (x - 6)^2$

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END
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