MTH-150, Chapter 1 Project

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1 Reflection

These problems were somewhat simple. With the help of the examples from the textbook and online courses, I was able to complete each problem with some confidence that I was correct. However, I did check the solution manual for each problem I completed to make sure my answer was correct. If it was not correct, I redid the problem until it was.

In Section 1.3, I had quite a bit of trouble figuring out how the answer was supposed to be formatted, as a fraction or decimal. Ever since I started learning math in elementary school, I far preferred decimals over fractions and that habit has stuck with me for some time. Despite the problems 5-10 being about slope, I changed each fraction into a decimal number, which in the specific case of number 5, had no repeating decimals so the end solution could be attained. However, I am aware that this was somewhat of a stroke of luck. I did the problem again, realizing the slope, and arrived at a better answer.

Also, the video lesson helped tremendously in my understanding of this section. The book does not explain it very well for me to understand at all, but the video lesson opened my eyes to being able to use a table to visualize the points on a graph and figure the slope from there instead of only relying on the long, confusing equation provided in the book.

I have not been able to get *Mathematica* to work as of yet. I have my Wolfram account made, but the link provided to activate my product key does not work, which I need to fix as soon as possible. I have been using the alternative provided at the bottom of the class page *Geogebra* instead for graphing purposes.

The thing that was hardest for me, and that I still need to work on, is transformation of functions - section 1.5. I still have to think twice about whether f(x+a) moves the graph of f(x) to the left or the right - this is not (yet!) intuitive for me.

I think overall this was the hardest part of chapter 1 for me and I still need to work on it. I watched the video lesson 1.5 a couple times and that helped. I also posted questions about transformation of functions and answers to those questions also helped. I will do more problems from this section as I get time: this is my biggest weakness to date.

2 Section 1.1: Functions and Function Notation

2.1 Worked example 1 (Page 17, Exercise 21)

Suppose $f(x) = 4 - 2x$. Evaluate $f(-2), f(-1), f(0), f(1), f(2)$
Answers:

1. $f(-2) = 4 - 2(-2) = 8$
2. $f(-1) = 4 - 2(-1) = 6$
3. $f(0) = 4 - 2(0) = 4$
4. $f(-1) = 4 - 2(1) = 2$
5. $f(2) = 4 - 2(2) = 0$

Comments
This is the simplest concept to understand in the whole chapter considering it is the most basic form of input/output functions. I had no trouble with this exercise. It is simply a matter of plugging in the f(x) into the x variable and completing the equation.

2.2 Worked example 2 (Page 17, Exercise 34)

Suppose $f(x) = 3^x$. Evaluate $f(-2), f(-1), f(0), f(1), f(2)$
Answers:

1. $f(-2) = \frac{1}{9}$
2. $f(-1) = \frac{1}{3}$
3. $f(0) = 1$
4. $f(1) = 3$
5. $f(2) = 9$

Comments
This was also rather simple, but the negative exponents had me thinking for a second before I remembered from high school that negative exponents make fractions. This is similar to the first example, except for that one minor curveball.

2.3 Worked example 3 (Page 18, Exercise 37)

Let $f(x) = 3t + 5$. Evaluate $f(0)$ and solve $f(t) = 0$
Answers:

1. $f(0) = 3(0) + 5 = 5$
2. $3t + 5 = 0$ $3t = -5$ $-\frac{5}{3}$

Comments
The explanation for this problem confused me slightly until I wrote it out and realized it was asking me for the answer to the function was 0 and if the variable was equal to 0. There was no confusion as to how to do it, only its explanation. Again, it is a matter of plugging in numbers to where I've been asked to plug them in and then solving for x or solving for f(x).

2.4 Worked example 4 (Page 19, Exercise 43)

Write the equation of the circle centered at (3,-9) with $r = 6$.
Answers:

1. $36 = (x - 3)^2 + (y + 9)^2$

Comments
This question also confused me slightly because I did not know how the answer was supposed to look. When looking at the answer key, it looks like how I wrote it here and in my work papers, which was a relief since I expected a flat quantity number instead of a formula. I used the definition in the text for the equation of a circle and plugged in the values given in the exercise.

3 Section 1.2: Domain and Range

3.1 Worked example 1 (Page 34, Exercise 12)

Find the domain of the function $f(x) = \frac{6}{x-8}$, which $x - 8$ does not equal 0 and x does not equal 8.

Answer:

Comments

This is the simplest concept to understand in the whole chapter considering it is the most basic form of input/output functions. I had no trouble with this exercise. It is simply a matter of plugging in the f(x) into the x variable and completing the equation.

4 Section 1.3: Rates of Change & Behavior of Graphs

5 Section 1.4: Composition of Functions

6 Section 1.5: Transformation of Functions

7 Section 1.6: Inverse Functions