Project 1

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Unit 1.1

For each of the following functions, evaluate: f (2) , f(-1) , f(0), f(1), and f(2)

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

x	-2	-1	0	1	2
f(x)	8	6	4	2	0

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

x	-2	-1	0	1	2
f(x)	14	11	8	5	2

33. $f(x) = 2^x$

x	-2	-1	0	1	2
f(x)	1/4	1/2	1	2	4

Reflection: This section of problems was relatively easy for me as I remember doing this in algebra. I verified that that the function works by ensuring that an "x" value does not equal more than one "y" value.

35. Suppose $f(x) = x^2 + 8x - 4$. Compute the following:
a. $f(-1) + f(1)$ b. $f(-1) - f(1)$

$f(-1) = (-1)^2 + 8(-1) - 4 = -11$
$f(1) = (1)^2 + 8(1) - 4 = 5$

$f(-1) + f(1) = -6$
$f(-1) - f(1) = -16$

Reflection: This problem was a review from my previous PreCalc experience. one thing that threw me off a bit were the negative numbers and squaring the first term on both.

43. Write the equation of the circle centered at (3 ,9) with radius 6.
$(x-3)^2+(y+9)^2=36$

44. Write the equation of the circle centered at (9 ,8) with radius 11.
$(x-9)^2+(y+8)^2=121$

Reflection: Both of these problems were scaring me with the phrase "write the equation". Once I knew I needed the Pythagorean theorem, that made it a bit easier. It also helped to draw a diagram of the points.

0.1 Unit 1.2

Find the domain of each function
14. $f(x)=\frac{3x+1}{4x+2}$
$f(1)=\frac{2}{3}$
Domain is $(-\infty,.-5)U(.5,\infty)$
Reflection: This question was not too difficult for me once I remembered what formula I needed to use.

Given each function, evaluate: $f(-1,0,2,4)$
19.$f(x)=\begin{cases}7x+3 & \text{if } x<0\\ 7x+6 & \text{if } x\geq 0\end{cases}$
$f(-1)=7(-1)+3=-4$
$f(0)=7(0)+6=6$
$f(2)=7(2)+6=20$
$f(4)=7(4)+6=34$
Reflection: I found this question relatively easy. It was just a bit tedious to impute into LaTeX due to all the different yet familiar equations.

31: Sketch a graph for each piecewise function.
$f(x)=\begin{cases}x^2 & \text{if } x<0\\ x+2 & \text{if } x\geq 0\end{cases}$
insert graph from mathmatica

34.
$f(x)=\begin{cases}x+1 & \text{if } x<1\\ x^3 & \text{if } x\geq 1\end{cases}$
insert mathmatica graph

0.2 Unit 1.3

Find the average rate of change on the interval specified
5. $f(x) = x^2 on [1, 5]$ $f(1) = 1$
points:$(1, 1)$

$f(5) = 25$
points: $(5, 25)$
Average rate of change: $\frac{1-25}{1-5} = \frac{-24}{-4} = 6$
Average rate of change =6

7. $g(x) = 3x^3 - 1 on [-3, 3]$
$g(-3) = 3(-3)^3 - 1 = -82$
points: $(-3, -82)$
$g(3) = 3(3)^3 - 1 = 80$
Points $(3, 80)$

Average rate of change: $\frac{-82-80}{-3-3} = \frac{-162}{-6} = 27$
Average rate of change= 27

Reflection: I found both of these questions relatively difficult. Most of the difficulty came from my inability to recognize the formula that I needed to use. Once I found that it was plug and play.

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

37. Use a graph to estimate the local extrema and inflection points of each function, and to estimate the intervals on which the function is increasing, decreasing, concave up, and concave down.
$f(x) = x^4 - 4x^3 + 5$

x	f(x)
-2	21
-1	8
0	5
1	-2
2	-11
3	-22
4	5

The function is increasing at $(-\infty, 3) u (3, \infty)$. The minimum of the function is 3. The function is concave down around (0,2) and concave up from $(2, \infty) and (-\infty, 0)$

Reflection: This question was difficult for me. I have never seen any questions like this before. It did not make sense until I was able to look in up in

the answer packet. One way I can improve on solving questions like this in the future would be to use more x values to get a better idea what the graph looks like. I can also use services like Mathmatica.