Project 3

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Units 3.1 - 3.8

Unit 3.1

Find the long run behavior of each function as x $\rightarrow$ and x $\rightarrow$
1. $f(x) = x^4$ All the values would be positive because it is taken to the 4th power and that will give us an even answer no matter what.
5. $f(x) = -x^2$ All values will be negative because all values will be multiplied by -1.
Reflection: These 2 were relatively easy for me. One thing that tripped me up was on number 5, I thought that all values would be positive because negative times negative, but after going over it in class it makes sense to me.

Find the degree and leading coefficient of each polynomial
15. $(2x + 3)(x - 4)(3x + 1)$ The leading coefficient is 6 and it is a degree of 3.
Reflection: This question was a little tough for me. I did a different one and I had to look it up in the solution manual and work backwards to learn how it works.

Find the long run behavior of each function as $+\infty and -\infty$
19.3x$^2 + x - 2$
$-\infty$ would still yield positive values because it is a 2nd degree polynomial which will make all values positive. $+\infty$ would also yield positive values because it has a positive coefficient.
Reflection: I thought this one was relatively easy because all you had to do is look at the value of the highest degree and if that degree was positive or negative.

21. What is the maximum number of x-intercepts and turning points for a polynomial of degree 5?
The maximum number of x-Interceps is 5 because it is going to make a minimum of 4 turns.
This one was not too difficult for me, mostly because we went over how to find

this quickly in class.

Find the vertical and horizontal intercepts of each function
31. $f(t) = 2(t-1)(t+2)(t-3)$
$f(0) = 2(0-1)(0+2)(0-3) = 12$
Our vertical intercept should be 12
Reflection: This question was a little difficult for me because I could not remember how to do it. I looked it up online and saw I just needed to substitute 0 for t, so that's what I did. I was originally getting 6, but then I realized I needed to multiply it by 2.
subsection*3.2
For each of the follow quadratic functions, find a) the vertex, b) the vertical intercept, and c) the horizontal intercepts.
9. $f(x) = 2x^2 - 10x + 4$
Vertex: (2.5,-8.5)
Verdical Intercept: (0,4)
Horizontal Intercept: (0.438,0) and (4.562,0)
Reflection: I thought this question was pretty hard and to be honest I still do not understand it. I will follow up with you in class about this question on Monday.

Rewrite the quadratic function into vertex form
13. $f(x) = x^2 - 12x + 32$
$a(x-h)^2 + k$ or $x^2 - 2hx - h^2 + k$
a= 1, h=6, k=-4
$f(x) = (x-6)^2 - 4$
Write an equation for a quadratic with the given features:
19. 19. x-intercepts (-3, 0) and (1, 0), and y intercept (0, 2)
$-\frac{2}{3} - \frac{4}{3} + 2$
Reflection: I am not too confident in my ability to do this again. I don't totally understand how to do this question.

27. A rocket is launched in the air. Its height, in meters above sea level, as a function of time, in seconds, is given by $h(t) = -4.9t^2 + 229t + 234$
a. From what height was the rocket launched?
the hight is 234m because we use 0 because it is asking us what the height is at the bottom or 0.
b. How high above sea level does the rocket reach its peak?
For this one we are trying to find its peak or the highest point on the graph so we have to solve for k. which equals 2910m
c. Assuming the rocket will splash down in the ocean, at what time does splash-down occur
for this one they want us to use quadratic formula and the height will be h=0.
$x = \frac{-b+\sqrt{b^2-4ac}}{2a}$
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3.3

Solve each inequality.
19. $(x-2)^2 > 0 when x = 3)$
I found this question relitivly easy. I just plugged in 3 to the first term and solved it and it worjed and matched the solution manual.

Write an equation for a polynomial the given features:
31. $f(x) = 2/3(x+1)(x-3)(x+2)$
This question was not the easiest. When we went over it in class I did not fully understand it, but I was able to visualize what a degree 3 function looked like and I was able to place the points on a graph. One thing that threw me was getting the graph to go through -4, mostly due to not fully understanding how a scale factor works.

51. A rectangle is inscribed with its base on the x axis and its upper corners on the parabola $y = 5 - x^2$. What are the dimensions of such a rectangle that has the greatest possible area?