MTH 150 Chapter 3

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1 Reflection

I found mostly sections 3.1 – 3.2 simple just because I have seen most of these problems in high school.

I had a little bit of trouble in section 3.2 on question 27. I was a bit confused how i should use the information i was given to solve the height of the ball in seconds.After a little review online i was able to get my desired outcome.

I found section 3.3 really easy as all i had to do was factor out my equation in order to get my real zeroes

As for section 3.4 i found it o be pretty simple since its basic plotting information that is given from the data. I also used graphs to help me find the points and was able to find all real possible zeroes

In section 3.7 i found it to be pretty easy as i worked with points and asymtope back in high school. Majority of the work felt pretty similar.

Sometimes when it came to finding the complex roots it became a bit difficult since i did not remember the equation used but after some quick research explaining the exercise the work became fairly easy.

2 Section 3.1 Power Functions Polynomial Functions

2.1 1,15,17,21

1. Find the long run behavior of each function as x $\rightarrow$ and x $\rightarrow$

$$x^4$$

$As f(x) approaches -\infty x approaches -\infty$
$As f(x) approaches \infty x approaches \infty$

15.Find the degree and leading coefficient of each polynomial

$$(2x+3)(x4)(3x+1)$$

$$(2x+3)(x-4) = 2x^2 - 5x - 12$$

$$(2x^2 - 5x - 12)(3x+1)$$

$$(6x^3 - 13x^2 - 41x - 12$$

Degree =3 Leading cf = 6

17 **F**ind the long run behavior of each function as x $\rightarrow$ and x $\rightarrow$

$$2x^4 3x^2 + x1$$

$As f(x) approaches -\infty x approaches -\infty$
$As f(x) approaches \infty x approaches -\infty$

21 *What is the maximum number of x-intercepts and turning points for a polynomial of degree 5?*
Total number equals 4

Comments
This was pretty simple, finding long behavior is easy as soon as you put it in graph form and working with degrees is easy.

3 Section 3.2 Quadratic Functions

3.1 7,13,20,27

7 *For each of the follow quadratic functions, find a) the vertex, b) the vertical intercept, and c) the horizontal intercepts.*

$$y(x) = 2x^2 + 10x + 12$$

A- Vertex (-2.5,-0.5)
B- Horizontal intercepts (-3,0)(-2,0)
C- Vertical Intercepts (0,12)

13 *Rewrite the quadratic function into vertex form.*

$$f(x) = x^2 - 12x + 32$$

$$x^2 - 12x + (-6)^2 - (-6)^2 + 32$$

$$(x-6)^2 - (-6)^2 + 32$$

$$f(x) = (x-6)^2 - 4$$

20 Write an equation for a quadratic with the given features $x - intercepts(2,0)and(-5,0), andyintercept(0,3)$

$$f(x) = a(x-2)(x+5)$$

$$3 = a(-2)(5)$$

$F(x) = -0,3(x-2)(x+5)$

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 + $29t234.A - 234$
$B - 4795feet$

Comments
This was pretty simple, only had trouble with exercise 27 as i did not know how to use the information to find desired outcome.

4 Section 3.3 Graphs of Polynomial Functions

4.1 19,31

19 Solve each inequality.

$$(x3)(x2)^2 > 0$$

$$2x^2 - 10x + 12$$

$$2(x-2)(x+3$$

$$x < 2 or x > 3$$

31 Write an equation for a polynomial the given features.

A Degree 3. Zeros at x = -2, x = 1, and x = 3. Vertical intercept at (0, -4)

$$ax^3 + bx^2 + cx + d$$

$$g(x) = ax^3 + bx^2 + cx + d$$

$$g(-2) = -, g(1) = 0, g(3) = -, g(4) = 0$$

Comments
This was pretty simple, had to be careful when i was factoring out the equation to make sure i get the right input.

5 Section 3.4 Factor Theorem and Remainder Theorem

5.1 21,22,1,3

21 ***Below you are given a polynomial and one of its zeros. Use the techniques in this section to find the rest of the real zeros and factor the polynomial.***

$$x^3 - 6x^2 + 11x - 6$$

Zeroes at x=
x=3
x=1
x=2

22

$$x^3 24x^2 + 192x 512$$

Zeroes at x =
x=-2
x=-1.73
x=1.73
Comments
This was pretty simple, i had worked with finding zeroes back in high school

6 Section 3.5 Real Zeros of Polynomials

6.1 1,3

1 ***For each of the following polynomials, use Cauchy's Bound to find an interval containing all the real zeros, then use Rational Roots Theorem to make a list of possible rational zeros.***

$$f(x) = x^3 2x^2 5x + 6$$

Real zero at x=
x=-2
x=1
x=3
Possible zero at x =
x=1
x=2
x=3
x=6

3

$$x^4 - 9x^2 - 4x + 12$$

Real zero at x=
x=-2
x=1
x=3
Possible zero at x =
x=1
x=2
x=3
x=6
x=4
x=12

7 Section 3.7 Rational Functions

7.1 5,6

5 ***For each function, find the horizontal intercepts, the vertical intercept, the vertical asymptotes, and the horizontal asymptote. Use that information to sketch a graph.***

$$\frac{2x-3}{x+4}$$

Horizontal Asymtope (0,2)
Vertical asymtope (-4,0)
x intercept (1.5,0)
Y intercept (0,-0.75)

6

$$\frac{x-6}{3x-1}$$

Horizontal Asymtope (0,2)
Vertical asymtope (-4,0)
x intercept (1.5,0)
Y intercept (0,-0.75)
This was fairly simple, got a little lost when trying to find the asymtope points as its been a while but the work was easy