Bell Work

Grab a book… we'll go over homework questions

And get ready for the quiz

From last time…

- Pg 176 #9, 19, 27, 31, 44, 71, 77, 113, 118

Unit 2 Quiz 1: Level 2

Identify the max/min and describe end behavior.

1.) $f(x) = -(x^2 + 2x - 3)$

2.) $h(x) = x^4 - 5x^2 + 4$

Unit 2 Quiz 1:
Level 3

Find all Zeros.

3.) $f(x) = 48x^3 - 80x^2 + 41x - 6$

4.) $g(x) = x^3 - 12x - 16$

Unit 2 Quiz 1: Level 4

5.) The path of a diver jumping into a pool is given by the following equation:

$$\mathrm{h} = -\frac{4}{9}d^2 + \frac{24}{9}d + 12$$

where h is the height (in feet) and d is the distance (in feet) from the diving board.

Answer the following:

--What is the maximum height the diver reaches, and how far are they from the board when they reach the max?

--How tall is the diving board?

--How far out into the pool did the diver land?

PRE-CALC TRIG

Day 17

2.6 Rational Function

- **Objective**: To identify properties (asymptotes) of rational functions
  To graph rational functions and state domain

- **HLQ**: What are the similarities and differences between a hole and a vertical asymptote? What impact does this have on our domain?

Forms of Rational Functions

$$f(x) = \frac{P(x)}{Q(x)}$$

$$y = \frac{ax + b}{cx + d}$$

Key Terms

- **Vertical Asymptote:** set denominator equal to 0 and solve for x

- **Horizontal Asymptote:**
  -- if degree in numerator is smaller than degree in the denominator: y=0
  -- if degree in numerator is bigger than degree in the denominator: no horizontal asymptote
  -- if degree is equal then horizontal asymptote is a/c

Types of Graphs

- **Continuous Graph:** the graph is “nonstop” there are no jumps or breaks or holes in the graph (you can draw it without picking up your pencil from the paper)
- **Discontinuous Graph:** there is a jump or break or hole in the graph because some value makes the denominator equal zero
- **Point of Discontinuity:** the x value that makes the denominator zero
- **Removable Discontinuity:** you can redefine the function so that you can find a value of the point of discontinuity by simplifying the function
- **Non-Removable Discontinuity:** there is no way to redefine the function to find the value of the point of discontinuity

Characteristics of the graph: $f(x) = \frac{p(x)}{q(x)}$

- The x-intercept of the graph of f are the real zeros of p(x)
- The graph of f has vertical asymptote at each real zero of q(x)
- The graph of f has at most one horizontal asymptote

  --If m<n [the degree of p(x) is m and degree of q(x) is n], the line y=0 is horizontal asy.

  --If m=n the line $y = \frac{am}{an}$ $is\ a\ horizontal\ asy.$

  --If m>n the graph has no horizontal asy.

Steps to Graphing:

- 1) Draw the asymptotes
- 2) Plot 2 or 3 “smart” points on each side of the vertical asymptote
- 3) Use points and asymptotes to draw branches

- **Or just use the calculator PLEASE!

Graph and State Domain and Range

1) $y = \frac{(x+3)(x+2)}{x+2}$

2) $y = \frac{x+3}{x^2-4x+3}$

For next time…

Page 190 #9-15(odd), 21, 25, 27, 41, 43, 79