MATH 117: HW # 3

Instructor: Joseph McGuire

Due: 09/25/2020 11:59pm

Please show your work for the following problems. These problems have solutions that are easily found online, so most of your grade will be based on explaining how we get the solution that we get.

1

Find all horizontal and vertical asymptotes (if any) of $r(x) = \frac{2x-3}{x^2-1}$

2

Give an example of a rational function that has vertical asymptote $x = 3$.

3

Now give an example of one that has vertical asymptote $x = 3$ and horizontal asymptote $y = 2$.

4

Solve the polynomial inequality: $(x-3)(x+5)(2x+5) < 0$, be careful that this never EQUALS zero, tell me ALL the values of x where this is strictly lesser than 0. Make sure to remember the difference between $\leq$ and $<$.

5

Solve the rational inequality: $\frac{1}{x} + \frac{1}{x+1} < \frac{2}{x+2}$. Be careful that the bottom of the fraction (denominator) never will equal zero, that's a vertical asymptote. Give me ALL the x-values where this is true. Make sure to remember the difference between $\leq$ and $<$

6 (Extra Credit)

Give an example of an application of a polynomial. (That I didn't discuss in lectures and is not found in the book.) What is the significance of the zeros of this polynomial? That is, what do the zeros of this polynomial tell us.