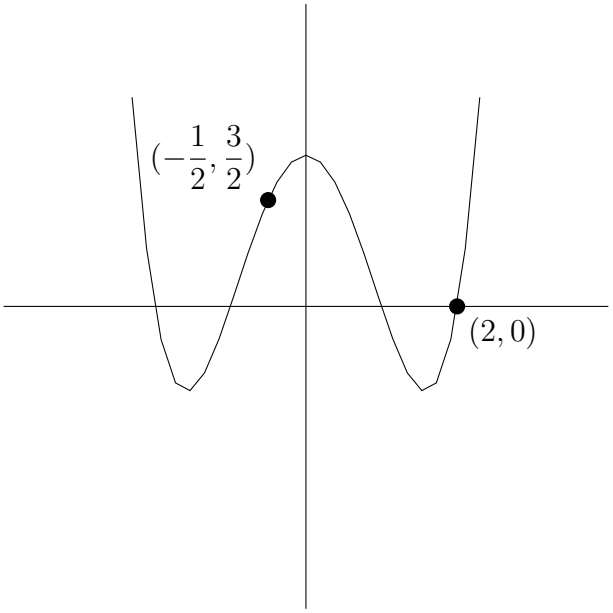
Math-19 Homework #10

Problems

1). Divide $8x^4 + 4x^3 + 6x^2$ by $2x^2 + 1$. Show *all* work and state your final answer in division algorithm form.

2). Consider the following graph of a polynomial:



a). What is the remainder when the polynomial is divided by $(x - 2)$?

b). What is the remainder when the polynomial is divided by $\left(x + \frac{1}{2}\right)$?

3). Consider the polynomial function:

$$y = 4x^7 - 4x^6 - 15x^5 + 16x^4 - 4x^3$$

a). Factor completely. You must show *all* work (clearly), including selection of candidates, determining which candidates are roots, and successively dividing out factors. Be sure to clearly state your final factorized form.

b). Sketch the graph. All intercepts must be labeled.

4). Consider the rational function:

$$y = \frac{3(x-1)^3(x^2-9)}{(2x^3-6x^2)(x^2-4)}$$

a). What are the zeros?

b). What are the poles?

c). What is the y-intercept?

d). What is the horizontal asymptote?

e). Sketch the graph. You must label all intercepts, asymptotes, and any holes that may occur. All zeros must have the proper shape and the end behaviors must be correct.