

Math 266A Group Work 4: Graphing a Cubic Polynomial

Thursday, March 02, 2006

Find the important points on the graph of the function $f(x) = x^3 - 3x^2 - 9x + 27$, and then graph it.

Hint: Think of the following list of questions, which starts easy and then gets harder.

Difficulty	Question	How do you answer it?
Easy	What is the y-intercept?	Call 1-800-ynt-rcpt and ask for Vinny.
Pretty easy.	What is the end behavior?	Consider degree & leading coefficient.
Not so easy.	When is f positive, negative, or zero?	Factor f and make a sign chart for it.
Getting hard.	When is f increasing, decreasing, or horizontal?	Factor f' and make a sign chart for it.
Crazy hard.	When is f concave up, down, or inflecting?	Factor f'' and make a sign chart for it.

Hint: the function can be factored $f(x) = x^3 - 3x^2 - 9x + 27 = (x+3)\left[(x-3)^2\right]$.