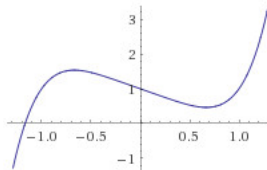**Problem 1.** *(2 points) Define the* domain *of a function f.*

Problem 2. *(2 points) Graph $f(x) = x^3$.*

Problem 3. *(5 points) Suppose we have the following income tax system: for the first $10,000 there is no tax. Any income past $10,000 is taxed at 10%, up to an income of $20,000. After than, any additional income is taxed at 20%.*

Write the amount of tax paid as a function of the income.

Problem 4. *(1 point) If you graph the polynomial $f(x) = x^5 - x + 1$, you'll see that it crosses the x-axis:*

The equation $0 = x^5 - x + 1$ should therefore have at least one solution. Is there a version of the quadratic formula that will tell you what this solution is?

Note: Your answer should be a sentence or two long and convince me you're not guessing.