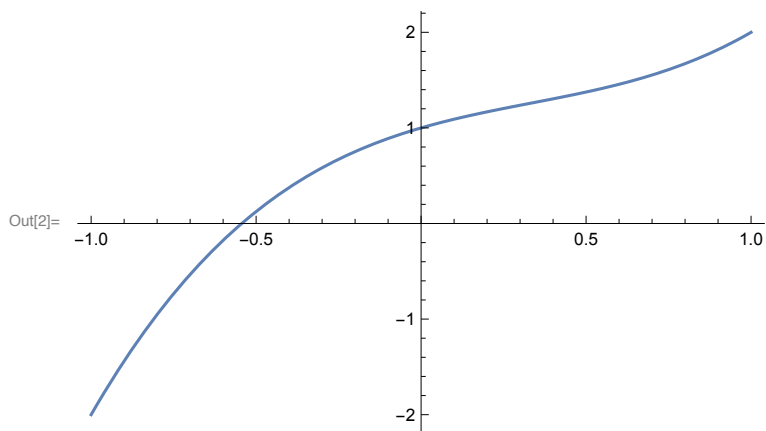(* Quiz 37 | AP Calculus AB | Comments / Answer Key *)

(* Problem 1 *)

In[1]:= **Integrate[x^3 - x^2 + x + 1, {x, -1, 1}]**

Out[1]= $\dfrac{4}{3}$

In[2]:= **Plot[x^3 - x^2 + x + 1, {x, -1, 1}]**

Out[2]=

(* Problem 2 *)

The definite integral measures net area, and hence it is a number. The indefinite integral is a function, or more precisely, a family of functions. The indefinite integral is also called 'antiderivative'.

(* Problem 3 *)

(* a *)

Set u = x^3. We have: du = 3x^2 dx. Remember the integration constant.

In[3]:= **Integrate[(x^2) / (1 + x^6), x]**

Out[3]= $\dfrac{\text{ArcTan}\left[x^3\right]}{3}$

(* b *)

Set u = sin x. We have: du = cos x dx. Remember the integration constant.

In[2]:= **Integrate[(Csc[Sin[x]])^2 Cos[x], x]**

Out[2]= $-\text{Cot}[\text{Sin}[x]]$