

Name: KEY

Show all work, clearly and legibly, to receive full credit. Correct spelling, organization of your solution, and proper use of mathematical notation all count. You may use a stand-alone graphing calculator, but not any internet-based calculators. No notes, books, or other additional resources are permitted. Good luck!

1.) (5 pts.) Use the IVT to show that $f(x) = x^5 + x^3 - 5x + 2$ has a root (that is, takes on the value 0) for some x in the interval $[0, 1]$.

- $f(x)$ is a polynomial, so continuous everywhere, in particular on $[0, 1]$
and: $[0, 1]$ is closed (includes 0, 1) and bounded (endpoints are finite)
- $a=0, f(a)=2, b=1, f(b)=-1$
 $y=0$ is a number between $f(a)$ and $f(b)$

Therefore IVT guarantees there is a c in $[0, 1]$ for which $f(c)=0$, that is, f has a root.

2.) (5 pts.) In the statement "If it's raining, then it's cloudy", which part is the hypothesis, and which part is the conclusion?

Hypothesis: "it's raining"

Conclusion: "it's cloudy"