

MATH 220: CALCULUS I
WORKSHEET 7
FEBRUARY 5, 2013

1. Without looking at your notes, state the condition for a function f to be *continuous* at a point a ?

2. Let $f(x) = \begin{cases} 1 + c \cdot \cos(x), & \text{if } x < \pi \\ \sin(x) - 2c, & \text{if } x \geq \pi \end{cases}$. What value of c makes f continuous everywhere?

3. Simplify $\sin(\arctan(x))$ and $\cos(\tan^{-1}(x))$.

4. Is $f(x) = \begin{cases} \sin(x), & \text{if } x \neq \pi \\ 1, & \text{if } x = \pi \end{cases}$ continuous at $x = \pi$?

5. Calculate the following limit: $\lim_{x \rightarrow \infty} \frac{2x^2 + 1}{\sqrt{x^4 - x + 2}}$.

6. Formally state the Intermediate Value Theorem (be precise).

7. Intuitively, what does the IVT *mean*?

8. State (but do not solve) one application of the IVT.