

Problem 1:

What are the two main definitions of continuity (one involves limits, one does not)? Using either definition, prove that if a function f is continuous and a function g is continuous, then the composition of f and g is continuous.

Problem 2:

If a function is bounded, what does this imply about the function's continuity?

Problem 3:

Using epsilon and delta, show whether the function $x^2 + 2x$ when $x \leq 2$ and $x^3 - 5x$ when $x > 2$ is continuous.

Problem 4:

Using either method, show whether $2x + 3y - (x^3 * y^2)$ is continuous.

Problem 5:

If two functions f, g are $\mathbb{R}^n \rightarrow \mathbb{R}^m$ are both continuous at $x=a$, prove that the function $f+g: \mathbb{R}^n \rightarrow \mathbb{R}^m$ is also continuous at $x=a$

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