Calculus, Fall 2004

Quiz 3

Nov 04 2004, 10:10 AM - 11:00 AM

Show all details.

(1) Graph the function $y = (x^2 - 3)/(2x - 4)$. Indicate all the asymptotes, critical points and inflection points, if any.

(2) Find the minimal distance between $y = \sqrt[4]{x}$, $x \geq 0$ to the point $(1, 0)$.

(3) Find the global maximum and minimum of $y = e^{x/\sqrt{x^4+1}}$. Explain.

(4) Let $f(x) = x^3 - 3x^2 - 1$, $x \geq 2$. Find the value of $df^{-1}(y)/dy$ at $y = -1 = f(3)$. (or, if you prefer, find the value of $df^{-1}(x)/dx$ at $x = -1 = f(3)$.)

(5) State (need not prove) the Mean Value Theorem. Then show that there is exactly one root for $f(x) = x^3 + 3x + 1$ on the interval $[-1, 1]$.

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