Name : _____ Math 1C, Lesson 8: In-Class Problems **Class Number**: _____

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1. Find the domain and range of the function $f(x, y) = \sqrt{80 - 5x^2 - 5y^2}$

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2. Evaluate the limit: $\displaystyle\lim_{(x,y)\to(1,3)} \frac{\sqrt{x+y} - 2}{x + y - 4}$

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3. Use the two-path test to prove that the following limit does not exist: $\displaystyle\lim_{(x,y)\to(0,0)} \frac{y^4 - 2x^2}{y^4 + x^2}$

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4. For what value(s) of m does $\displaystyle\lim_{(x,y)\to(0,0)} \frac{3xy^2}{y^4 + x^2} = 0.6$ along the path $x = my^2$.

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5. Evaluate the following limit: $\displaystyle\lim_{(x,y)\to(0,0)} \frac{y^2}{x^4 + y^2} = 0.6$.

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6. Find the limit $\displaystyle\lim_{(x,y)\to(0,0)} \frac{\sin(x^2 + y^2)}{x^2 + y^2}$.