

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. (a) Find and sketch on the xy -plane the domain of the function $f(x, y) = \frac{\ln(x - y)}{\sqrt{16 - x^2 - y^2}}$.
Please show clearly all your work.

- (b) Find and sketch on the xy -plane the level curves of $f(x, y) = \sqrt{y - x^2}$, with $c = 0, 1, 2$.
Please, show all your work.

2. Show that the limit

$$\lim_{(x,y) \rightarrow (2,0)} \frac{3(x-2)y}{(x-2)^2 + 8y^2}$$

does not exist. Please, give a short verbal description for each of your steps so that your work is easy to follow.