

Name _____ Date _____

Instructions: Please show all of your work as partial credit will be given where appropriate, **and** there may be no credit given for problems where there is no work shown. All answers should be completely simplified, unless otherwise stated.

1. (15 points) Find all critical points for $f(x, y) = \cos x + \cos y + \cos(x + y)$ (assume $x, y \in (0, \pi)$). Indicate whether each point is a max, min or saddle point.

Answer: _____

2. (10 points) Express the number 21 as a sum of three positive numbers such that the product of these three numbers is a maximum.

Answer: _____

3. (10 points) Find all critical points of the function $f(x, y) = e^{x^2 + y^2 - 4y}$.

Answer : _____