"QUIZ" for Lecture 11

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E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q11FirstLast.pdf) ASAP BUT NO LATER THAN Oct. 12, 8:00pm Deadline extended to Oct. 17

1. Use Largange multipliers (no credit for other methods) to find the **smallest** value that x+y +z can be, given that xyz = 125

1. $f_x = 1 \quad f_y = 1 \quad f_z = 1 \quad \nabla f = \langle 1, 1, 1 \rangle$

$g_x = yz \quad f_y = xz \quad f_z = xy \quad \nabla g = \langle yz, xz, xy \rangle$

$\lambda \langle 1, 1, 1 \rangle = \langle yz, xz, xy \rangle$

$\{yz = \lambda, xz = \lambda, xy = \lambda, xyz = 125\}$

$\{x = 5, y = 5, z = 5, \lambda = 25\}$

Plug in

$f(5, 5, 5) = 15.$

2. Use Largange multipliers (no credit for other methods) to find the **largest** value that xyz can be, given that x + y + z = 15

2. $f_x = yz, \quad f_y = xz, \quad f_z = xy$

$\cancel{fg}\ g_x = 1, \quad \cancel{f_y} = 1, \quad g_z = 1$

$\lambda \langle 1, 1, 1 \rangle = \langle yz, xz, xy \rangle$

$\{yz = \lambda, xz = \lambda, xy = \lambda, x + y + z = 15\}$

$\{x = 5, y = 5, z = 5, \lambda = 25$

plug in

$f(5, 5, 5) = 125$