

"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 Lagrange multipliers (no credit for other methods) to find the **smallest** value that  $x + y + z$  can be, given that  $xyz = 125$

$$\nabla f = \langle 1, 1, 1 \rangle \quad \nabla g = \langle yz, xz, xy \rangle$$
$$\lambda \nabla f = \nabla g$$
$$\lambda = yz \quad \lambda = xz \quad \lambda = xy \quad xyz = 125$$

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

$$\nabla f = \langle yz, xz, xy \rangle \quad \nabla g = \langle 1, 1, 1 \rangle$$
$$\nabla f = \lambda \nabla g$$
$$yz = \lambda \quad xz = \lambda \quad xy = \lambda$$
$$x + y + z = 15$$
$$3\lambda = 15$$
$$\lambda = 5$$
$$yz = 5$$
$$xz = 5$$
$$xy = 5$$