

10/10/20. Quiz for Lecture 11 Khush Taha

1) - Minimum of  $x, y, z = f$   
 $xyz = 125 = g$

$$\nabla f = \langle 1, 1, 1 \rangle$$

$$\nabla g = \langle yz, xz, xy \rangle$$

$$1 = \lambda yz$$

$$1 = \lambda xz$$

$$1 = \lambda xy$$

$$\frac{xyz}{yz} = 1$$

$$\frac{xyz}{xz} = 1$$

$$\frac{xyz}{xy} = 1$$

$$x = y$$

$$y = x$$

$$x = z$$

$$xyz = 125$$

$$x^3 = 125$$

$$x = 5$$

Point is  $(5, 5, 5) = 15$ .

2)  $\nabla f = \langle yz, xz, yx \rangle$

$$\nabla g = \langle 1, 1, 1 \rangle$$

$$yz = \lambda = xz = yx$$

$$\lambda = (yz) = 15$$

$$\lambda = yz = 15$$

$$x = xz$$

$$1 = \frac{y}{x}$$

$$x = y$$

Point  $\rightarrow 5, 5, 5 = x$

$$5^3 = 125$$