Will Legg - Quiz 4

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$\nabla f = \langle 2x, 1 \rangle$

$\nabla g = \langle 2x-6, 1 \rangle$

$\nabla f = \lambda \nabla g$

$\langle 2x, 1 \rangle = \lambda \langle 2x-6, 0 \rangle$

$2x = \lambda(2x-6)$

$1 = \lambda(1)$

$y = x^2 - 6x$

$x \neq 0 \rightarrow 1 = \lambda$

$y = -5 \quad x = -5, 1$

$(-5,-5) \quad (1,-5)$

if $x = 0 \quad y = 0 \rightarrow (0,0)$

$x = -5 \rightarrow \lambda = 5/8$

$x = 1 \rightarrow \lambda = -1/2$

$\lambda = 5/8$

$(-5,-5)$ (-5)

$\lambda = -1/2$

$(1,-5) \quad (0,0)$

$f(-5,-5) = (-5)^2 + (-5) = 20 \leftarrow$ local max

$f(1,-5) = (1)^2 + (-5) = -4 \leftarrow$ local min

$f(0,0) = (0)^2 + (0) = 0$