$$f(x,y) = \frac{\sqrt{x^2+y^2-25}}{\ln(x-y)}$$

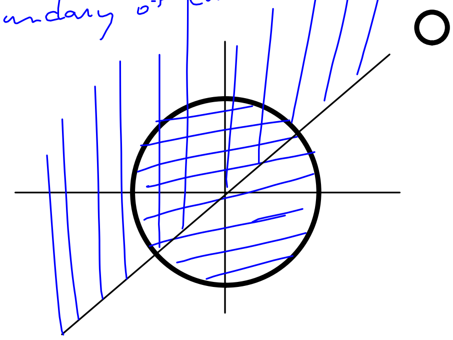
Need: $x^2+y^2-25 \geq 0 \Rightarrow x^2+y^2 \geq 25$

$x-y > 0$

$x > y$

$y < x$

Need to be outside or on the boundary of circle



§14.8 #5

$f(x,y) = x^2 y$, s.t. $x^2 + 2y^2 = 6$

$\nabla f = \langle 2xy, x^2 \rangle$

$\nabla g = \langle 2x, 4y \rangle$

$\nabla f = \lambda \nabla g$

$\langle 2xy, x^2 \rangle = \langle 2\lambda x, 4\lambda y \rangle$

$f_x = \lambda g_x$ $\quad 2xy = 2\lambda x$ $\quad\quad x^2 = 4\lambda y = 4y^2$ $\quad f_y = \lambda g_y$

$y = \lambda$ $\quad\quad \sqrt{x^2} = \sqrt{4y^2} = 2\sqrt{y^2}$

$|x| = 2|y|$

$x = \pm 2y$

$\Rightarrow x^2 + 2y^2 = (\pm 2y)^2 + 2y^2 = 4y^2 + 2y^2 = 6y^2 = 6$

$\Rightarrow y = \pm 1$

$\Rightarrow x = \pm 2$

$f(x,y) = x^2 y$ $\quad (2,1), (2,-1), (-2,1), (-2,-1)$ to check.

$f(2,1) = 2^2(1) = 4$

$f(2,-1) = 2^2(-1) = -4$

$f(-2,1) = 4$

$f(-2,-1) = -4$

Max of 4 @ $(2,1), (-2,1)$

Min of -4 @ $(2,-1), (-2,-1)$

How to come up with eq'n of intersection?

$f(x,y) = x^2 y$, $g(x,y) = x^2 + 2y^2 = 6$

$x^2 = 6 - 2y^2$

Work on this, Mills.

$x = \pm\sqrt{6 - 2y^2}$

$\Rightarrow f(x,y) = \left(\pm\sqrt{6-2y^2}\right)^2 y = (6 - 2y^2)y$