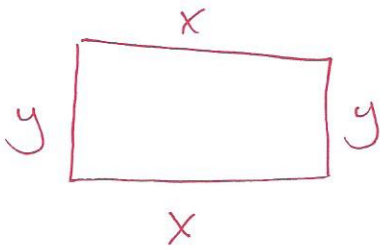
quiz 21
math1117.02
u new haven
f 06 dec

name: Solution

1 (4 points). Of all rectangles with area 100, which one has the minimum perimeter?



Objective: $P = 2x + 2y$

Constraint: Area: $xy = 100$

$P = 2x + 2\left(\frac{100}{x}\right)$

$= 2x + 200x^{-1}$

$P' = 2 - 200x^{-2}$

$P' = 0$

$2 - 200x^{-2} = 0$

$2 = \frac{200}{x^2}$

$x^2 = 100$

$x = 10$

$y = \frac{100}{x} = \frac{100}{10} = 10$

The square w/ sides 10 minimizes the perimeter.