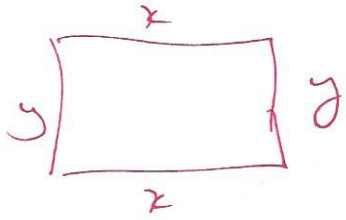
quiz 22
math1117.07
u new haven
f 06 dec

name: Solution

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



Minimize: $P = 2x + 2y$

use: $xy = 100 \Rightarrow x = \frac{100}{y}$

sub into P:

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

$$P' = \frac{-200}{y^2} + 2$$

set $P' = 0$:

$$0 = \frac{-200}{y^2} + 2$$

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

$$y^2 = 100$$

$$y = \pm 10$$

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

Therefore, the rectangle is the square with sides 10.