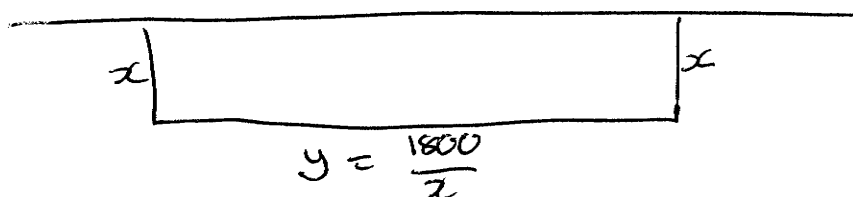


Math 220 AD9, Spring 2009, Quiz 7

Name: _____

1. (Q.3, p. 317) A three-sided fence is to be built next to a straight section of river, which forms the fourth side of a rectangular region. The enclosed area is to equal 1800 ft^2 . Find the minimum perimeter and the dimensions of the corresponding enclosure.



$$xy = 1800$$

$$y = \frac{1800}{x}$$

$$P(x) = 2x + \frac{1800}{x}$$

$$x \in (0, +\infty)$$

$$P'(x) = 2 - \frac{1800}{x^2}$$

$$P'(x) = 0$$

when

$$2x^2 = 1800$$

$$x^2 = 900$$

$$x = \pm 30$$

($x = -30$, not in domain)

Undefined at $x = 0$, not in domain.

$$x = 30, y = 60, P(30) = 120$$

(Minimum as $P''(30) = +\frac{3600}{30^3} > 0$)

at "endpoints", $P(x) \rightarrow +\infty$.