

A farmer has 2400 ft of fencing and wants to fence off a rectangular field that borders a straight river. He needs no fencing along the river. What are the dimensions of the field that has the largest area? What is the area?

1200

600 $A = 120000 \text{ ft}^2$ 600

$A = l \times w$

$A = (2400 - 2w)w$

$A = 2400w - 2w^2$

$P = w + w + l$

$P = 2w + l$

$2400 = 2w + l$

$l = 2400 - 2w$

$A = 2400 - 4w$

$0 = 2400 - 4w$

$4w = 2400$

$w = 600$

Apr 28-7:29 PM

Calculus 120
Unit 4: Applications of Differentiation

May 14, 2019: Day #11

1. Missed Quizzes and Late Assignments
2. Quiz on Thursday - One Optimization Problem
3. Assignment Due Wednesday

Jan 9-1:43 PM

Curriculum Outcomes

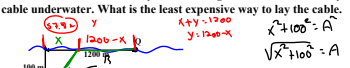
C8: Use Calculus techniques to sketch the graph of a function.

C9: Use Calculus techniques to solve optimization problems

C11: Use Calculus techniques to solve problems involving related rates.

Jan 24-9:32 AM

A cable television company is laying cable in an area with underground utilities. Two subdivisions are located on opposite sides of Willow Creek, which is 100 m wide. The company has to connect Points P and Q with cable, where Q is on the north bank, 1200 m east of P. It costs \$40/m to lay cable underground and \$80/m to lay cable underwater. What is the least expensive way to lay the cable.



$C = 80A + 40B$

$C = 80\sqrt{x^2 + 10000} + 40(1200 - x)$

$C = 80(x^2 + 10000)^{1/2} + 48000 - 40x$

$C' = 40(x^2 + 10000)^{-1/2} (2x) - 40$

$0 = \frac{80x}{\sqrt{x^2 + 10000}} - 40$

$40 = \frac{80x}{\sqrt{x^2 + 10000}}$

$40\sqrt{x^2 + 10000} = 80x$

$(\sqrt{x^2 + 10000})^2 = (2x)^2$

$x^2 + 10000 = 4x^2$

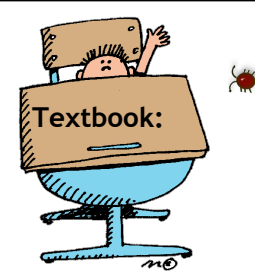
$3x^2 = 10000$

$x^2 = 3333.3$

$x = 57.7$

Lay the cable underwater to a pt 57.7m down river from a pt across from P. Then go underground the remaining distance.

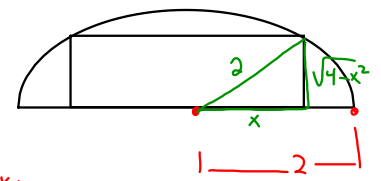
May 12-3:41 PM



Assignment!

Textbook:

Jan 13-9:38 PM



$A = l \times w$

$A = (2x) \times (\sqrt{4 - x^2})$

May 16-9:32 AM

Attachments

2.1_74_AP.html



2.1_74_AP.swf



2.1_74_AP.html