

WebAssign

assignment 23, Mar 8, section 4.5 (part 3) (Homework)

Jeremy Alameda
(Spring 2013) Math 146 Applied Calculus I at noon, section 146-03, Spring 2013
Instructor: Stuart Farm

Current Score : 1 / 13

Due : Thursday, March 21 2013 11:00 PM CDT

1. -/3 points

TanApCalcBr9 4.5.010.

A rectangular box is to have a square base and a volume of 20 ft^3 . If the material for the base costs $\$0.33$ per square foot, the material for the sides costs $\$0.10$ per square foot, and the material for the top costs $\$0.17$ per square foot, determine the dimensions of the box that can be constructed at minimum cost.

length ft

width ft

height ft

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2. 0/3 points | [Previous Answers](#)

TanApCalcBr9 4.5.019.

The owner of a luxury motor yacht that sails among the 4000 Greek islands charges $\$832$ /person/day if exactly 20 people sign up for the cruise. However, if more than 20 people sign up (up to the maximum capacity of 100) for the cruise, then each fare is reduced by $\$8$ for each additional passenger.

Assuming at least 20 people sign up for the cruise, determine how many passengers will result in the maximum revenue for the owner of the yacht.

406 ✖ passengers

What is the maximum revenue?

$\$$ 181476 ✖

What would be the fare/passenger in this case? (Round your answer to the nearest dollar.)

447 ✖ dollars per passenger

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3. -/1 points

TanApCalcBr9 4.5.021.

A truck gets $500/x$ miles per gallon (mpg) when driven at a constant speed of x mph, where $40 \leq x \leq 80$. If the price of fuel is $\$2.80$ /gal and the driver is paid $\$18$ /hr, at what speed is it most economical for the trucker to drive? (Round your answer to two decimal places.)

mi/h

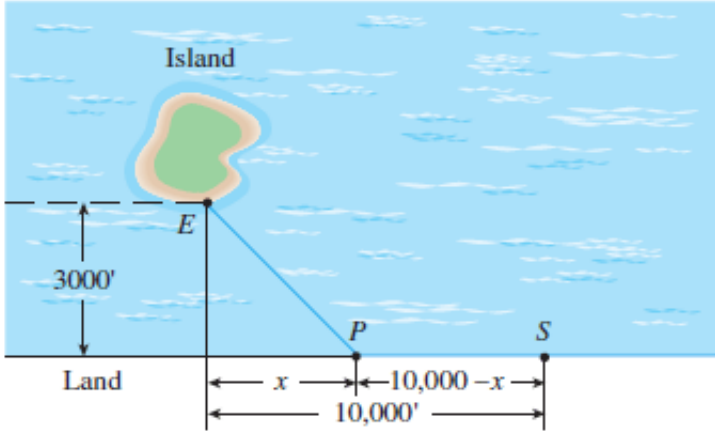
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In the following diagram, S represents the position of a power relay station located on a straight coast, and E shows the location of a marine biology experimental station on an island. A cable is to be laid connecting the relay station with the experimental station. If the cost of running the cable on land is \$1.50/running foot and the cost of running the cable under water is \$2.55/running foot, locate the point P that will result in a minimum cost (solve for x). (Round your answer to the nearest whole number.)

$x =$ ft



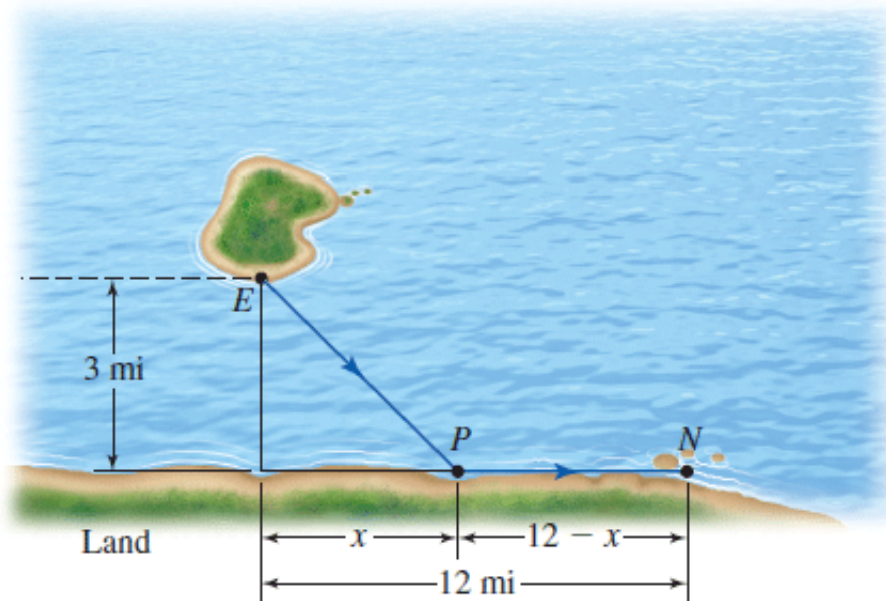
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During daylight hours some birds fly more slowly over water than over land because some of their energy is expended in overcoming the downdrafts of air over open bodies of water. Suppose a bird that flies at a constant speed of 2 mph over water and 5 mph over land starts its journey at the point E on an island and ends at its nest N on the shore of the mainland, as shown in the figure. Find the location of the point P that allows the bird to complete its journey in the minimum time (solve for x). (Round your answer to one decimal place.)

$x =$ mi



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The weekly demand for the Pulsar 40-in. high-definition television is given by the demand equation

$$p = -0.06x + 604 \quad (0 \leq x \leq 12,000)$$

where p denotes the wholesale unit price in dollars and x denotes the quantity demanded. The weekly total cost function associated with manufacturing these sets is given by

$$C(x) = 0.000001x^3 - 0.04x^2 + 400x + 80,000$$

where $C(x)$ denotes the total cost incurred in producing x sets. Find the level of production that will yield a maximum profit for the manufacturer. **Hint:** Use the quadratic formula. (Round your answer to the nearest whole number.)

✗ units

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Find the inflection point(s), if any, of the function. (If an answer does not exist, enter DNE.)

$$g(x) = 2x^4 - 4x^3 + 5$$

$(x, y) =$ _____ (smaller x-value)

$($ _____ \times $)$

$(x, y) =$ _____ (larger x-value)

$($ _____ $)$

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Find the inflection point(s), if any, of the function. (If an answer does not exist, enter DNE.)

$$f(x) = (x - 5)^{4/3}$$

$(x, y) =$ _____ \checkmark _____

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