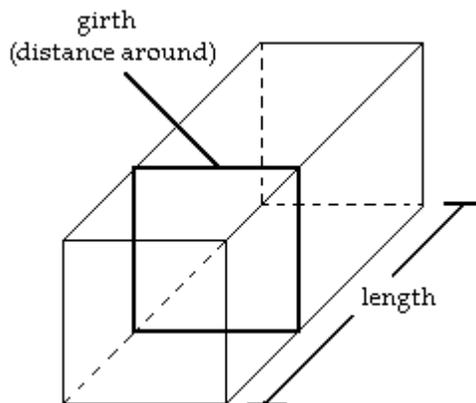


Optimization Problems 2

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the problem.

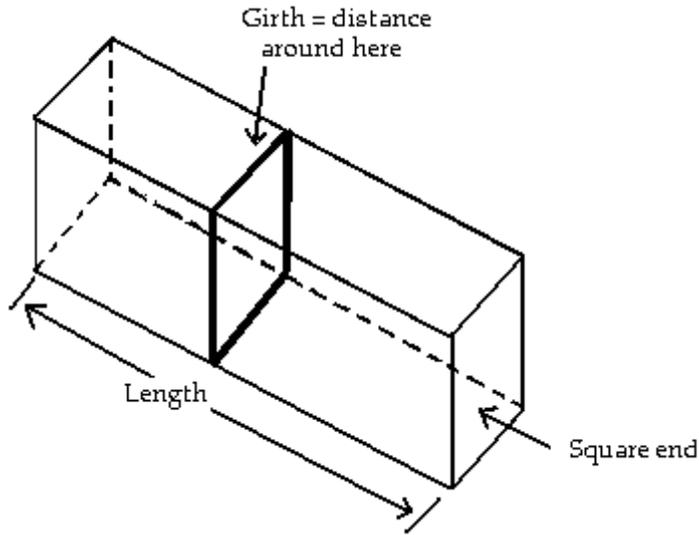
- 1) The price P of a certain computer system decreases immediately after its introduction and then increases. If the price P is estimated by the formula $P = 170t^2 - 1700t + 6400$, where t is the time in months from its introduction, find the time until the minimum price is reached. 1) _____
A) 5 months B) 10 months C) 20 months D) 8.5 months
- 2) The price P of a certain computer system decreases immediately after its introduction and then increases. If the price P is estimated by the formula $P = 190t^2 - 2100t + 6400$, where t is the time in months from its introduction, find the time until the minimum price is reached. 2) _____
A) 5.5 months B) 11.1 months C) 10.5 months D) 22.1 months
- 3) The cost of a computer system increases with increased processor speeds. The cost C of a system as a function of processor speed is estimated as $C = 5S^2 - 4S + 1000$, where S is the processor speed in MHz. Find the processor speed for which cost is at a minimum. 3) _____
A) 0.2 MHz B) 0.4 MHz C) 3.2 MHz D) 8 MHz
- 4) The cost of a computer system increases with increased processor speeds. The cost C of a system as a function of processor speed is estimated as $C = 15S^2 - 6S + 2000$, where S is the processor speed in MHz. Find the processor speed for which cost is at a minimum. 4) _____
A) 1.6 MHz B) 0.3 MHz C) 0.2 MHz D) 4 MHz
- 5) A private shipping company will accept a box for domestic shipment only if the sum of its length and girth (distance around) does not exceed 114 inches. What dimensions will give a box with a square end the largest possible volume? 5) _____



- A) 19 in. by 38 in. by 38 in. B) 38 in. by 38 in. by 38 in.
C) 19 in. by 19 in. by 38 in. D) 19 in. by 19 in. by 95 in.

- 6) A private shipping company will accept a box for domestic shipment only if the sum of its length and girth (distance around) does not exceed 120 in. What dimensions will give a box with a square end the largest possible volume?

6) _____



- A) 20 in. \times 20 in. \times 40 in. B) 20 in. \times 20 in. \times 100 in.
 C) 20 in. \times 40 in. \times 40 in. D) 40 in. \times 40 in. \times 40 in.

- 7) If the price charged for a candy bar is $p(x)$ cents, then x thousand candy bars will be sold in a certain city, where $p(x) = 113 - \frac{x}{14}$. How many candy bars must be sold to maximize revenue?

7) _____

- A) 1582 candy bars B) 791 candy bars
 C) 1582 thousand candy bars D) 791 thousand candy bars

- 8) If the price charged for a candy bar is $p(x)$ cents, then x thousand candy bars will be sold in a certain city, where $p(x) = 141 - \frac{x}{28}$. How many candy bars must be sold to maximize revenue?

8) _____

- A) 1,974 candy bars B) 3,948 thousand candy bars
 C) 1,974 thousand candy bars D) 3,948 candy bars

- 9) The altitude h , in feet, of a jet that goes into a dive and then again turns upward is given by $h = 12t^3 - 198t^2 + 9500$, where t is the time, in seconds, of the dive and turn. What is the altitude of the jet when it turns up out of the dive?

9) _____

- A) 1514 ft B) 1660 ft C) 1588 ft D) 1700 ft

- 10) A company wishes to manufacture a box with a volume of 24 cubic feet that is open on top and is twice as long as it is wide. Find the width of the box that can be produced using the minimum amount of material. Round to the nearest tenth, if necessary.

10) _____

- A) 5.2 ft B) 6.4 ft C) 2.6 ft D) 3.2 ft

Answer Key

Testname: OPTIMIZATION PROBLEMS 2

- 1) A
- 2) A
- 3) B
- 4) C
- 5) C
- 6) A
- 7) D
- 8) C
- 9) A
- 10) C