Swok

OPTIMIZATION REVIEW

1. A fence 8 ft tall stands on level ground and runs parallel to a tall building. If the fence is 1 foot from the building, find the length of the shortest ladder that will extend from the ground over the fence to the wall of the building.

2. A page of a book is to have an area of 90 in^2, with 1-inch margins at the bottom and sides and a ½ inch margin at the top. Find the dimensions of the page that will allow the largest printed area.

3. A builder intends to construct a storage shed having a volume of 900 ft^3, a flat roof, and a rectangular base whose width is ¾ the length. The cost per square foot of the materials is $4 for the floor, $6 for the sides, and $3 for the roof. What dimensions will minimize the cost?

4. A hotel that charges $80 per day for a room gives special rates to organizations that reserve between 30 and 60 rooms. If more than 30 rooms are reserved, the charge per room is decreased by $1 times the number of rooms over 30. Under these conditions, how many rooms must be rented if the hotel is to receive the maximum income per day?

5. A steel storage tank for propane gas is to be constructed in the shape of a right circular cylinder with a hemisphere at each end. The construction cost per square foot for the end pieces is twice that for the cylindrical piece. If the desired capacity is 10π ft^3, what dimensions will minimize the cost of construction?

6. Find the dimensions of the rectangle of maximum area that can be inscribed in a semicircle of radius a, if two vertices lie on the diameter.

7. Find the point on the graph of $y=x^3$ that is closest to the point (4, 0).

8. A paper cup is to be constructed in the shape of a right circular cone. If the volume desired is 36π in^3, find the dimensions that require the least amount of paper. (Disregard any waste in construction)

9. Two vertical poles of lengths 6 ft and 8 ft stand on level ground, with their bases 10 ft apart. Find the minimal length of cable that can reach from the top of one pole to some point on the ground between the poles and then to the top of the other pole.

10. STUDY THE OTHER WORKSHEET AND PROBLEMS FROM BOOK. GO BACK OVER AND BE PREPARED TO WORK ANY SIMILAR TYPES!!!

1. $5\sqrt{5}$ ft 2. $\sqrt{120}$ in x $\frac{90}{\sqrt{120}}$ in 3. 13.38 x 10.04 x 6.69 ft 4. 55 rooms 5. r = [illegible] ft h = [illegible]

6. $\sqrt{2}a$ x $\frac{\sqrt{2}}{2}a$ 7. (1,1) 8. $r=3\sqrt{2}$ in h=6 in 9. 17.2 ft