

Optimization Problems

1. A rectangular garden 200 sq. m. in area is to be fenced off against rabbits. Find the dimensions that will require the least amount of fencing if one side is already protected by a barn.
2. A cylindrical tin can is to hold 50 cubic cm of tomato juice. How should the can be constructed in order to minimize the amount of material needed in its construction?
3. Find the point on the straight line $3x - 4y = 12$ which is closest to the point $(1, 2)$.
4. The top and bottom margins of a poster are each 6 cm and the side margins are each 4cm. If the area of printed material on the poster is fixed at 384 cm^2 , find the dimensions of the poster with the smallest area.
5. Find the dimensions of the right circular cylinder of largest volume that can be inscribed in a sphere of radius R .
6. A fence 8 ft tall runs parallel to a tall building at a distance of 4 ft from the building. What is the length of the shortest ladder that will reach the ground over the fence to the wall of the building?

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