

October 31, 2002

1. Find two positive numbers whose product is 100 and whose sum is a minimum.
2. Find the dimensions of a rectangle with area $1000m^2$ whose perimeter is as small as possible.
3. You have been hired to make a box with a square base and open top with a volume of $32,000cm^3$. Find the dimensions of the box that minimizes the material used.
4. Find the point on the line $6x + y = 9$ that is closest to the point $(-3, 1)$.
5. The top and bottom margins of a poster are each $6cm$ and the side margins are each $4cm$. If the area of printed material on the poster is fixed at $384cm^2$, find the dimensions of the poster with the smallest area.