1. Find the point on the line $y = 2x + 3$ which is closest to the origin.

2. The top and bottom margins of a poster are each 6 cm and the side margins are 4 cm. If the area of the printed material on the poster is fixed at 384 cm^2, find the dimensions of the poster with the smallest total area.

3. A cone-shaped drinking cup is made from a circular piece of waxed paper of radius R by cutting out a sector, as shown, and joining the edges CA and CB. Find the maximum capacity of the cup.