BC CALCULUS PRACTICE 5.5A **Name:** _____ **Period** _____

Aisle _____

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Show all work for full credit.

2. How should two nonnegative numbers be chosen so that their sum is 1 and the sum of their squares is
(a) as large as possible
(b) as small as possible?

5. A rectangular plot of land is to be fenced in using two kinds of fencing. Two opposite sides will use heavy-duty fencing selling for \$3 a foot, while the remaining two sides will use standard fencing selling for \$2 a foot. What are the dimensions of the rectangular plot of greatest area that can be fenced in at a cost of \$6000?

9. Find the dimensions of the rectangle with maximum area that can be inscribed in a circle of radius 10.

13. Show that among all rectangles with area A, the square has the minimum perimeter.

14. A wire of length 12 in can be bent into a circle, bent into a square, or cut into two pieces to make both a circle and a square. How much wire should be used for the circle if the total area enclosed by the figure(s) is to be
(a) a maximum (b) a minimum?

17. A box with a square base is taller than it is wide. In order to send the box through the U.S. mail, the height of the box and the perimeter of the base can sum to no more than 108 in. What is the maximum volume of such box?

19. An open box is to be made from a 3-ft by 8-ft rectangular piece of sheet metal by cutting out squares of equal size from the four corners and bending up the sides. Find the maximum volume that the box can have.

24. Find the dimensions of the right circular cylinder of largest volume that can be inscribed in a sphere of radius R.