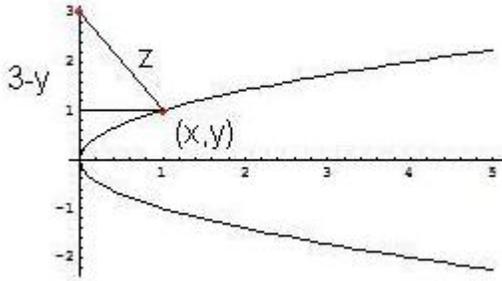


Group Problems

1. Find the point(s) on the parabola $x = y^2$ closest to the point $(0, 3)$.



2. American Airlines requires that the total outside dimensions (length + width + height) of a carry on bag not exceed 45 inches. Suppose you want to carry on a bag whose length is twice its height. What is the largest volume bag of this shape that you can carry onto an American Airlines flight?
3. A hockey team plays in an arena with a seating capacity of 15,000 spectators. With the ticket price set at \$12, average attendance at a game has been 11,000. A market survey indicates that for each dollar the ticket price is lowered, average attendance will increase by 1000. How should the owners of the team set the price to maximize their revenue from ticket sales?
4. A box-shaped wire frame consists of two identical wire squares whose vertices are connected by four straight wires of equal length. If the frame is to be made from a wire of length 200 feet, what should the dimensions be to obtain a box of greatest volume?
5. The figure below depicts a racetrack with ends that are semicircular in shape. The perimeter of the track is 1760 feet ($1/3$ mile). Find l and r so that the area enclosed by the rectangular region of the racetrack is as large as possible. What is the area enclosed by the track in this case?

