

Lesson 30  
Optimization (I)

1. A woman wants to build a rectangular garden next to a straight river. She will enclose the garden on 3 sides with fencing—the remaining side runs along the river and doesn't require fencing. If she has 100 ft of fencing what dimensions should the garden be so that the area is as large as possible? (25 ft by 50ft)
2. Find the radius and height of the circular cylinder of largest volume that can be inscribed inside a right circular cone of radius 6 in and height 10 in. (Radius 4 in; height  $10/3$  in)
3. A plank of wood is used to reach over an 8 ft high fence to prop up a wall 1 ft behind the fence. What is the shortest plank that can be used? ( $125^{1/2}$  ft)

Lesson 31  
Optimization (II)

1. A baseball team plays in a stadium that holds 55,000 people. With ticket prices at \$12 the average attendance had been 21,000. For every \$1 reduction in ticket price the attendance increases by 3,000. What ticket price to the nearest cent maximizes revenue? (\$9.50)
2. Boat A leaves a dock at 4 pm and travels north at 20 mi/h. Boat B has been heading west at 15 mi/h and reaches the dock at 5 pm. At what time were the boats closest? (4:22 pm)
3. A pipe must be carried horizontally around a corner from a hallway 8 ft wide to a hallway 4 ft wide. What is the longest pipe that can be carried around the corner? ( $4(1+2^{2/3})^{3/2}$  ft)