

## Practice Problems — 03/09/05

- (1) A rectangular storage container with an open top is to have a volume of 10 cubic meters. The length of its base is twice the width. Material for the base costs \$10 per square meter, and material for the sides costs \$6 per square meter. Find the cost of materials for the cheapest such container.

- (2) Find two numbers whose sum is 23 and whose product is a maximum.

(3) Find two positive numbers whose product is 100 and whose sum is a minimum.

(4) Find the point closest to  $(1, 1)$  on the line  $y = -3x - 2$ .

- (5) You're standing at point  $A$  below, and your car sits at point  $B$ , 4 miles to the north and 10 miles to the east. Between your car and you is a muddy bog that is 4 miles across. From personal experience, you know you can run 3 miles an hour through boggy terrain, and 5 miles an hour outside boggy terrain. To which point on the opposite side of the bog should you run in order to minimize the amount of time it takes to get to your car?