1. (2 pts) Find two numbers A and B (with $A \leq B$) whose difference is 40 and whose product is minimized.

$A =$ _____

$B =$ _____

Answer(s) submitted:

-
-

(incorrect)

2. (2 pts) A box is to be made out of a 10 by 20 piece of cardboard. Squares of equal size will be cut out of each corner, and then the ends and sides will be folded up to form a box with an open top. Find the length L, width W, and height H of the resulting box that maximizes the volume. (Assume that $W \leq L$).

$L =$ _____

$W =$ _____

$H =$ _____

Answer(s) submitted:

-
-
-

(incorrect)

3. (2 pts) A rectangular storage container with an open top is to have a volume of 70 cubic meters. The length of its base is twice the width. Material for the base costs 70 dollars per square meter. Material for the sides costs 3 dollars per square meter. Find the cost of materials for the cheapest such container.

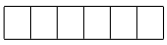
Minimum cost = _____.

Answer(s) submitted:

-

(incorrect)

4. (2 pts) A pig farmer wants to enclose a rectangular area and then divide it into six pens with fencing parallel to one side of the rectangle (see the figure below). There are 760 feet of fencing available to complete the job. What is the largest possible total area of the six pens?



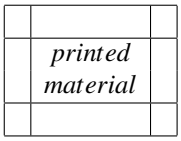
Largest area = _____ (include **units**)

Answer(s) submitted:

-

(incorrect)

5. (2 pts) The top and bottom margins of a poster are 2 cm and the side margins are each 8 cm. If the area of printed material on the poster is fixed at 390 square centimeters, find the dimensions of the poster with the smallest area.



Width = _____ (include **units**)

Height = _____ (include **units**)

Answer(s) submitted:

-
-

(incorrect)

6. (2 pts) A rectangle is inscribed with its base on the x-axis and its upper corners on the parabola $y = 11 - x^2$. What are the dimensions of such a rectangle with the greatest possible area?

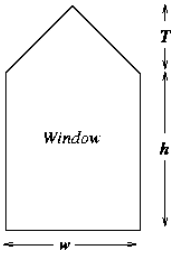
Width = _____ Height = _____

Answer(s) submitted:

-
-

(incorrect)

7. (2 pts) Consider a window the shape of which is a rectangle of height h surmounted by a triangle having a height T that is 0.8 times the width w of the rectangle (as shown in the figure below).



If the cross-sectional area is A, determine the dimensions of the window which minimize the perimeter.

$h =$ _____

$w =$ _____

Answer(s) submitted:

-
-

(incorrect)