

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECTION 4.5

Math 1000 Worksheet

FALL 2023

For practice only. Not to be submitted.

1. A farmer has 1000 metres of wooden fencing, and she wishes to fence off a rectangular plot of land bordered by a river, so that she does not require fencing on the side of the rectangle adjacent to the water. Find the dimensions of the rectangular plot with the greatest possible enclosed area.
2. A special shipping tube consists of a cylinder which is closed on the bottom but capped by a hemisphere on the top. Its total volume is 1 cubic metre. The material which forms the cylindrical part of the tube (including the bottom) costs \$2.00 per square metre, while the material to make the hemispherical top costs \$3.50 per square metre. What is the cost of the cheapest such tube?
3. The top and bottom margins of a poster are each 6 cm and the side margins are each 4 cm. The area of the printed material on the poster (which must fall within the margins) is 384 cm^2 . What are the dimensions of the poster with the smallest area?
4. The Roadrunner leaves Toon Town at 2:00pm and runs due south at a speed of 20 km/hr. One hour later, Wile E Coyote crashlands in Toon Town, having been travelling due east at 15 km/hr via ACME™ Super-Slingshot. To the nearest minute, at what time were the Roadrunner and Wile E Coyote closest together?