Math 120 A, B - Winter 2010
Mid-Term Exam Number Two
February 25, 2010
Answers

There were two versions of the exam in use.

Version A: Problem 1 involved 100 cm of wire.

1. (a) To minimize the combined area, the square should have side length 10.87411 cm, and the triangle should have side length 18.8345 cm. (b) To maximize the combined area, the square should have length 25 cm, and the triangle should have side length 0 cm.

2. (a) $f(x) = \dfrac{40x + 145}{x + 32.5}$ (b) -8.8620 and 16.3620

3. 37.1213 years after 1960

4. (a) $f(x) = \dfrac{3x}{-2x - 3}$ (b) $f^{-1}(x) = \dfrac{-3x}{3 + 2x}$

Version B: Problem 2 involved 80 cm of wire.

1. (a) To minimize the combined area, the square should have side length 8.69929 cm, and the triangle should have side length 15.0676 cm. (b) To maximize the combined area, the square should have length 20 cm, and the triangle should have side length 0 cm.

2. (a) $f(x) = \dfrac{30x + 150}{x + 20.5}$ (b) -8.386 and 17.886

3. 24.605 years after 1960

4. (a) $f(x) = \dfrac{2x}{8x - 28}$ (b) $f^{-1}(x) = \dfrac{-28x}{2 - 8x}$