

## MATH 1030: Homework 4

due September 14, 2012

**Instructions:** Do the following problems on a separate sheet of paper. Show all of your work.

### Book Exercises

§2A Exercises 39, 42, 55, 79, 81

### Problem 1: Pen Pals

Help pen pals Geraldine and Andryushka (both age 11) understand each other's country by doing the following problems. Show all your work.

- (a) Andryushka has been studying the oil crisis and writes to Geraldine to tell her that the average price of a gallon of gasoline in Moscow is 23.49 Russian rubles (RUR) per liter. Help Geraldine figure out how many dollars per gallon it would be.  
(1 dollar = 29.93 RUR and 1 gallon = 3.785 liters)
- (b) Andryushka has been learning how to quilt recently and asks Geraldine (an avid quilter) if she has a favorite pattern. The pattern Geraldine sends him asks for 100 square feet of material. Help Andryushka know how many square meters of fabric he needs to have.  
(1 meter = 3.28 feet)
- (c) Geraldine has recently learned that there are 7.48 gallons in 1 cubic foot. She excitedly writes to Andryushka and asks him how many liters are in a cubic meter. Help Andryushka perform this calculation.
- (d) "It sure is cold here in Russia," Andryushka writes. "This last winter, the average temperature where I lived was negative 15 degrees Celcius ( $-15^{\circ}$ )." Help Geraldine convert the temperature into Fahrenheit.
- (e) "Is there a temperature where the number of degrees Celcius is equal to the number of degrees Fahrenheit?" Geraldine inquires. "In fact, there is only one such temperature," Andryushka replies. Help Geraldine figure out what that temperature is.
- (f) The average price of gas in the United States is \$3.67 per gallon. Suppose that Andryushka's family is visiting and that they rent a car that gets 13 kilometers per liter. If they have to travel a total of 250 miles, how much will they spend on gasoline in RUR?  
(1 dollar = 29.93 RUR, 1 mile = 1.609 kilometers, 1 gallon = 3.785 liters)