

**CS2984: Introduction to Problem Solving, Fall 2007**  
**Homework Assignment 5**  
**Due at 11:00pm on Tuesday, September 25**  
**30 Points**

Here are the problems for Homework 5.

1. Write

$$\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \cdots + \frac{1}{99 \cdot 100}$$

as a fraction in lowest terms. You may not use a computer or calculator to solve the problem.

2. (Note: You really do get enough information in this problem to solve it!)

A census-taker knocks on a door, and asks the woman inside how many children she has and how old they are.

“I have three daughters, their ages are whole numbers, and the product of the ages is 36” says the mother.

“That’s not enough information,” responds the census-taker.

“I’d tell you the sum of their ages, but you’d still be stumped.”

“I wish you’d tell me something more” says the census-taker.

“Okay, my oldest daughter Annie likes dogs” says the mother.

What are the ages of the three daughters?

3. Three women check into a motel room that advertises a rate of \$27 per night. They each give \$10 to the porter, and ask her to bring back three dollar bills. The porter returns to the desk, where she learns that the room is actually only \$25 per night. She gives \$25 to the desk clerk, returns to the room, and gives the guests back each one dollar, deciding not to tell them about the actual rate. Thus the porter has pocketed \$2, while each guest has spent  $10 - 1 = \$9$ , a total of  $2 + 3 \times 9 = \$29$ . What happened to the other dollar?