Tutorials in this course are collaborative tutorials. This means that you will work with a group of one or two other students, discussing the situations and puzzles listed below or issues arising from lectures. A tutor or lecturer will help you during the tutorial. Part of your final mark for the course depends on your participation and enthusiasm in tutorials: you can get up to 10 marks towards your final mark by attending and actively participating in all tutorials. Up to 15 marks more will be awarded for the quality of your write-up of selected tutorial questions. Not all tutorial questions need to be written up - each tutorial sheet will tell you which question or questions to write up. More details about what is expected in tutorial reports are given below.

By discussing the following situations with your tutorial group, try to work out together a solution to each of the following puzzles. Make sure everyone in the group contributes to the discussion. When you have an answer to a puzzle that everyone agrees with, make some notes outlining how you worked out the answer. Then try to explain your answer to your tutor or lecturer. You should aim to discuss **all but the last Mindscape** during the tutorial. The final Mindscape is harder – do this only if you have time.

Note that some hints on resolving these puzzles are contained in the textbook, starting at page 32.

1. (Mindscape 1, Chapter 1 of the textbook). Suppose that Don Brash and Helen Clark each have the same amount of money in their pockets. How much must Don give to Helen so that Helen would have $10 more than Don?

Write up your answer to the following Mindscape and hand it in with your answers to Assignment 1 (due Friday March 9th). See below for instructions on writing tutorial reports. Don't forget to write down the names of the people in your tutorial group, so that you can acknowledge your collaborators in your report.

2. (Mindscape 4, Chapter 1 of the textbook). Fifty-six lamingtons are to be fed to 10 pets. Each pet is either a kauri snail or a ferocious lion. Each lion is to get six lamingtons, while each snail is to get five. How many lions are there? (Warning: There may be more than one possible answer.)

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3. (Mindscape 5, Chapter 1 of the textbook). There are two boxes: one marked A and one marked B. Each box contains either $1 million or a deadly snake that will kill you instantly. You must open one box. On box A there is a sign that reads: "At least one of these boxes contains $1 million." On box B there is a sign that reads: "A deadly snake that will kill you instantly is in box A." You are told that either both signs are true or both are false. Which box do you open? Be careful, the wrong answer is fatal!

4. (Mindscape 11, Chapter 1 of the textbook). Three strangers, Bob, Mary, and Ivan, meet at a taxi stand and decide to share a cab to cut down on the cost. Each has a different destination, but all the destinations are on the highway leading from the airport, so no

circuitous driving is required. Bob's destination is 10 kilometres away, Mary's is 20 kilometres, and Ivan's is 30 kilometres. The taxi costs $1.50 per kilometre, regardless of the number of passengers. How much should each person pay? (Caution: there is more than one way of looking at this situation. A good place to start would be to discuss what would be a fair way to divide the costs.)

5. (Mindscape 14, Chapter 1 of the textbook). This one is harder. Only attempt it if you have answered all the other puzzles and still have time for more.

Stacy and Sam Smyth were known for throwing a heck of a good party. At one of their wild gatherings, five couples were present (this included the Smyth's, of course). The attendees were cordial, and some even shook hands with other guests.

Although we have no idea who shook hands with whom, we do know that no one shook hands with themselves and no one shook hands with his or her spouse. Given these facts, a guest might not shake anyone's hand or might shake as many as eight other people's hands. At midnight, Sam Smyth gathered the crowd and asked the nine other people how many hands each of them had shaken.

Much to Sam's amazement, each person gave a different answer. That is, someone didn't shake any hands, someone else shook one hand, someone else shook two hands, someone else shook three hands, and so forth, down to the last person, who shook eight hands. Given this outcome, determine the exact number of hands that Stacy Smyth shook.

Writing up tutorial questions.

Your solution to the boxed Mindscape above should be written up and handed in with **Assignment 1**. (All assignments contain instructions on how they should be submitted.) Your Mindscape solution should include:
  • the names of the people you discussed this with in your tutorial group;
  • a clear statement of your final solution;
  • a clear explanation (in one or two paragraphs) or how you arrived at this solution;
  • a statement of any assumptions you made in obtaining your answer.

Marks for the report will be based on the clarity of your writing. You should aim for well-written, polished answers. The markers will not be concerned with the spelling and grammar of your writing, but will pay close attention to the logic of your statements. You may find it helpful to get someone who is not taking this course to read your answer to check that your explanations are clear.

You should write your report in your own words. **Do not copy** from another person or allow another person to copy from you, including the other members of your tutorial group.