

MATH 506 Mathematical Reasoning – Session 10

Exercise #1

Write a step-by-step procedure (algorithm) to round a number expressed to the nearest 0.1 to the nearest integer.

Exercise #2

Write a step-by-step procedure (algorithm) to find the real roots of a quadratic equation, if any exist.

Puzzle #1

Initially, two vegetarians and two cannibals are on the left bank of a river. With them is a boat that can hold a maximum of two people. The aim of the puzzle is to find a way to transport all the vegetarians and cannibals to the right bank of the river. What makes this difficult is that at no time can the number of cannibals on either bank outnumber the number of vegetarians. Otherwise, disaster befalls the vegetarians.

Puzzle #2

Another famous puzzle first appeared around 775 A.D. It involves a wolf, a goat, a bag of cabbage, and a ferryman. From an initial position on the left bank of a river, the ferryman is to transport the wolf, the goat, and the cabbage to the right bank. The difficulty is that the ferryman's boat is only big enough for him to transport one object at a time, other than himself. Yet, for obvious reasons, the wolf cannot be left alone with the goat, and the goat cannot be left alone with the cabbage. How should the ferryman proceed?