

Question 3 [12 marks] Jockeys in the United States and England work very hard to keep their weight down. Many participate in weight-loss programs, carefully monitor their diet, and exercise regularly. The weight of a male jockey is approximately normal, with mean 52 kg and standard deviation 1.2 kg. Suppose a male jockey is randomly selected.

- a. **[3 marks]** What is the probability that the jockey weighs more than 53 kg? Show **all your work** in order to get full marks.
- b. **[3 marks]** What is the probability that the jockey weighs between 50 and 54 kg? Show **all your work** in order to get full marks.
- c. **[3 marks]** Find a value w such that 80% of all male jockeys weigh more than w . Show **all your work** in order to get full marks.
- d. **[3 marks]** Suppose the jockey selected weighs 57 kg. Is there any evidence to suggest the claimed mean (52 kg) is wrong? Justify your answer. Show **all your work** in order to get full marks.