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5. Chris runs boat trips between two islands during the summer. During her trips, Chris claims that whales are seen randomly at a mean rate of 2 in every 9 trips.

To investigate Chris's claim, a random sample of 18 boat trips run by Chris was taken.

(a) Using a 5% level of significance, find the critical region, for a two-tailed test, to enable Chris to test her claim.

(3)

(b) State the actual level of significance of this test.

(1)

The total number of whales seen in the 18 boat trips was 6

(c) State what this suggests about Chris's claim. Give a reason for your answer.

(1)

The following summer, Chris decides to run n trips so that the probability of her seeing at least one whale is more than 0.9

(d) Assuming Chris's claim is true, find the minimum value of n.

(4)

Chris believes that she sees fewer whales during the winter. A random sample of 45 trips run in the winter was taken and the total number of whales seen was 5

(e) Test, at the 5% level of significance, whether or not the mean rate of whales seen in winter is less than 2 in every 9 trips. State your hypotheses clearly.

(4)

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Question 5 continued

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Q5