

Quiz 1

The duration of this test is 15 minutes. Collaboration is prohibited, as are documents (textbook, personal notes) and calculators.

Partial credit will be given for incomplete yet relevant attempts.

1. Out of an urn with balls labelled from 1 to n , one draws k balls without replacement. Using only factorials, what is the number of possible outcomes, assuming they are unordered?

2. A spaceship radio has broken down and is sending out a random sequence of 5 letters on loop. Assuming the random sequence is uniform, what is (a formula for) the probability that the sequence contains the letters "SOS" in order?

(For instance, "SOSST" contains "SOS", but "VSOAS" and "SJJSO" do not.)

3. In a class of 20 students, a group of 5 is selected uniformly at random to work on a gardening project.

(a) You don't mind participating, but only if you are with your buddy Mike. What is (a formula for) the probability that you will be disappointed?

(b) Your pals Mike and Sarah have bad blood since that night at O'Malley's. Maybe working on something together will have them patch it up? **Knowing that you and Mike have been selected**, what is (a formula for) the probability that Sarah has been selected as well?