

Part 8.7 Answers

1a. A Poisson distribution is best. This is because:

- The occurrence of droppages are **Random**
- The occurrence of one droppage is **Independent** from the other droppages
- The number of droppages is **Proportional** to the amount of time spent waiting
- Two droppages cannot occur **Simultaneously**.

1bi. 0.0384 (3sf)

1bii. 0.887 (3sf)

1biii. 0.0183 (3sf). As the waiter gets more experienced you'd expect them to drop less dishes, so the independent assumption probably isn't valid, neither is the proportional.

1c. mean = 3.577 (4sf) so 89.4 hours (3sf)

2a. A Poisson distribution is best. This is because:

- The occurrence of gumdrops is **Random**
- The occurrence of one gumdrops is **Independent** from the other gumdrops
- The number of gumdrops is **Proportional** to the amount of ice-cream.
- Two gumdrops cannot be in the same place (cannot occur **Simultaneously**).

2bi. 0.0620 (3sf)

2bii. 0.0753 (3sf)

2biii. 0.904 (3sf)

2c. mean = 0.145 (3sf), so volume = 7.25 mL

3a. A Poisson distribution is best. This is because:

- The occurrence of pieces of pepperoni is **Random**
- The occurrence of one piece of pepperoni is **Independent** from the other pieces of pepperoni
- The number of pieces of pepperoni is **Proportional** to the size / number of pizzas
- Two pieces of pepperoni cannot be in the same place (cannot occur **Simultaneously**).

3bi. 0.470 (3sf)

3bii. 0.157 (3sf)

3biii. 0.262 (3sf).

3c. 28

4a. A Poisson distribution is best. This is because:

- The occurrence of complaints is **Random**
- The occurrence of a complaint is **Independent** from the complaints
- The number of complaints is **Proportional** to the amount of time
- Two complaints cannot occur **Simultaneously**.

4b. 0.00232 (3sf)

4c. 2.30 (3sf) complaints.