Normal distributions

6 questions | 18 marks

Equivalent correct methods earn the corresponding marks.

1. For X~N(40,9), state the mean and standard deviation. [3 marks]

The second parameter is variance 9.

Take its positive square root.

Answer: μ=40; σ=3.

2. A normal model has μ=100 and σ=15. Standardise x=85. [3 marks]

(85-100)/15=-1.

Answer: z=-1.

3. For μ=60 and σ=5, give the approximate central 68% interval. [3 marks]

Use μ±σ.

Answer: 55 to 65.

4. For μ=60 and σ=5, give the approximate central 99.7% interval. [3 marks]

Use μ±3σ.

Answer: 45 to 75.

5. In a continuous normal model, find P(X=μ). [3 marks]

A single point has zero interval width and area.

This does not mean values near μ are unlikely.

Answer: 0.

6. A histogram has two well-separated peaks. Is a single normal model automatically justified by knowing its mean and SD? [3 marks]

Investigate distinct groups or another distribution.

Answer: No. The bimodal shape suggests that one bell-shaped model may be unsuitable.