

IB Maths AA SL Unit 4 Statistics and Probability Practice Exam: Mark Scheme

IB Mathematics: Analysis and Approaches SL · 11 questions · 55 marks

- M marks are for a correct method; A marks for an accurate answer that follows a correct method; R marks are for clear reasoning.
- Accept any correct method that reaches a correct answer, unless the question says which method to use.
- Practise these topics online with instant feedback: ibmathrevision.com/SLAAUnit4

Section A: no calculator

Question 1

3 marks

a. $0.8 \times 0.5 = 0.4$ **A1**

b. $\frac{0.4}{0.6}$ **(M1)**
 $= \frac{2}{3}$ **A1**

Question 2

3 marks

a. $28 - 12 = 16$ **A1**

b. $\frac{4}{40} \times 100$ **(M1)**
 $= 10\%$ **A1**

Question 3

3 marks

a. $\bar{x} = 0.5(12) + 2$ **(M1)**
 $= 8$ **A1**

b. $x = 0.5(20) + 2 = 12$ **A1**

Question 4

4 marks

a. $0.65 = 0.3 + P(B) - 0.3P(B)$ **M1A1**

$0.7P(B) = 0.35 \implies P(B) = 0.5$ **A1**

b. independent, so $P(A' | B) = P(A') = 0.7$ **A1**

Question 5

8 marks

a. median = 10 **A1**

$Q_1 = 7, Q_3 = 14.5$ **A1A1**

b. $Q_3 + 1.5 \times \text{IQR} = 14.5 + 1.5(7.5) = 25.75$ **M1A1**
 $30 > 25.75$ **R1AG**

c. box from 7 to 14.5 with median at 10 **A1**
 whiskers to 3 and 17, outlier marked at 30 **A1**



Question 6

4 marks

- a. $X \sim B\left(4, \frac{1}{6}\right)$ **A1**
- b. $\binom{4}{2} \left(\frac{1}{6}\right)^2 \left(\frac{5}{6}\right)^2$ **(M1)**
 $= \frac{150}{1296} = \frac{25}{216}$ **A1**
- c. $\frac{2}{3}$ **A1**

Question 7

7 marks

- a. discrete **A1**
- b. $\frac{80}{1200} \times 420$ **(M1)**
 Year 10: 28, Year 11: 30, Year 12: 22 **A1A1**
- c. interval $1200 \div 80 = 15$ **A1**
 random start between 1 and 15, then every 15th student **A1**
- d. convenience sample: students who use the canteen (early) are over-represented **R1**

Section B: calculator allowed**Question 8**

4 marks

- a. $0.7(0.03) + 0.3(0.05)$ **(M1)**
 $= 0.036$ **A1**
- b. $\frac{0.015}{0.036}$ **(M1)**
 $= 0.417$ **A1**

Question 9

7 marks

- a. 40th value **(M1)**
 30.8 minutes **A1**
- b. $Q_1 = 22.2$, $Q_3 = 39.2$ **A1A1**
 IQR = 17.0 minutes **A1**
- c. $74 - 62 = 12$ **A1**
- d. $30 < t \leq 40$ (frequency 24) **A1**

Question 10

4 marks

- a. $P\left(Z > \frac{3}{\sigma}\right) = 0.05$ **(M1)**
 $\frac{3}{\sigma} = 1.645$ **(A1)**
 $\sigma = 1.82$ mm **A1**
- b. $= 0.136$ **A1**



Question 11

8 marks

- a. $P(H > 185) = 0.0521$ **A1**
- b. $P(H > h) = 0.25$ **(M1)**
 $h = 177.4$ cm **A1**
- c. $P(H > d) \leq 0.01 \implies d \geq 190.6$ **(M1)A1**
 $d = 191$ cm **A1**
- d. $B(5, p)$ with p from (a) **(M1)**
 $= 0.0231$ **A1**

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