

# Solomon Practice Paper

## Statistics S1 – J

**Time allowed:** 90 minutes

**Centre:** [www.CasperYC.club](http://www.CasperYC.club)

**Name:**

**Teacher:**

Question	Points	Score
1	11	
2	11	
3	12	
4	13	
5	14	
6	14	
Total:	75	

**How I can achieve better:**

- 
- 
- 



Last updated:

July 14, 2025



1. A net was used to catch swallows so that they could be ringed and examined. The weights of 55 adult birds were recorded and the results are summarised in the table below.

Weight (g)	14 - 19	20 - 21	22 - 23	24 - 25	26 - 29	30 - 35
Frequency	3	6	15	20	9	2

- (a) For these data calculate estimates of

[5]

- i. the median,
- ii. the 33rd percentile.

These data are represented by a histogram and the bar representing the 24 - 25 group is 1 cm wide and 20 cm high.

- (b) Calculate the dimensions of the bars representing the groups

[6]

- i. 20 - 21
- ii. 26 - 29

Total: 11



2. The discrete random variable  $X$  has the probability function shown below.

$$\Pr(X = x) = \begin{cases} \frac{k}{x}, & x = 1, 2, 3, 4 \\ 0, & \text{otherwise.} \end{cases}$$

(a) Show that  $k = \frac{12}{25}$ .

[3]

Find

(b)  $F(2)$ ,

[2]

(c)  $E(X)$ ,

[2]

(d)  $E(X^2 + 2)$ .

[4]

Total: 11



3. A study was made of the heights of boys of different ages in Lancashire.

The study concluded that the heights of 13 year-old boys are normally distributed with a mean of 156 cm and a variance of  $73 \text{ cm}^2$ .

Find the probability that a 13 year-old boy chosen at random will be

- (a) more than 165 cm tall, [3]
- (b) between 156 and 165 cm tall. [2]

The study also concluded that the heights of 14 year-old boys are normally distributed with a mean of 160 cm and a variance of  $79 \text{ cm}^2$ . One 13 year-old and one 14 year-old boy are chosen at random.

- (c) Find the probability that both boys are more than 165 cm tall. [5]
- (d) State, with a reason, whether the probability that the combined height of the two boys is more than 330 cm is more or less than your answer to part (c). [2]

Total: 12



4. A company offering a bicycle courier service within London collected data on the delivery times for a sample of jobs completed by staff at each of its two offices.

The times,  $t$  minutes, for 20 deliveries handled by the company's Hammersmith office were summarised by

$$\sum t = 427, \quad \text{and} \quad \sum t^2 = 11077.$$

- (a) Find the mean and variance of the delivery times in this sample.

The company's Holborn office handles more business, so the delivery times for a sample of 30 jobs handled by this office was taken. The mean and standard deviation of this sample were 18.5 minutes and 8.2 minutes respectively.

- (b) Find the mean and variance of the delivery times of the combined sample of 50 deliveries.

Total: 13



5. A College employs 75 teachers, of whom 47 are full-time and the rest are part-time. Of the 39 male teachers at the College, 26 are full-time.
- (a) Represent this information on a Venn diagram. [3]
  - (b) One teacher is selected at random to be interviewed by an inspector. [4]
    - i. works full-time and is female,
    - ii. works part-time, given that he is male.
  - (c) Three teachers are selected at random to be observed by an inspector during one day. Find [7]  
correct to 3 significant figures the probability that
    - i. all three teachers chosen work full-time,
    - ii. at least one of the three teachers chosen is female.

Total: 14



- |          |     |      |      |      |      |      |      |      |
|----------|-----|------|------|------|------|------|------|------|
| $m$ (g)  | 50  | 100  | 200  | 300  | 400  | 500  | 600  | 700  |
| $l$ (cm) | 7.8 | 10.7 | 16.5 | 22.1 | 28.0 | 33.9 | 35.2 | 35.6 |

- Total: 14

