

# AS Maths Stats 2021

1. (a)  $1 - (0.2 + 0.2 + 0.1 + 0.2) = 0.3$

(b) A and C

2.  $\text{Frey}^y \text{ density} = \frac{\text{Frey}}{\text{CW}} = \frac{90}{20} = \underline{\underline{4.5 \text{ squares high}}}$

Note  $5-20$   $\frac{45}{15} = 3$  Frequency Density

So each block bold line is 1.

$0-5$   $\frac{5}{5} = \underline{\underline{1 \text{ high}}}$

Age	$0 \leq x < 5$	$5 \leq x < 20$	$20 \leq x < 40$	$40 \leq x < 65$	$65 \leq x < 80$	$80 \leq x < 90$
F	5	45	90	$5 \times 25 = 130$	$4 \times 15 = 60$	1

CF      5      50      140      270      330      331

$$\frac{331}{2} = 165.5$$

$$165.5 - 140 = 25.5$$

$$\frac{25.5}{130} \times 25 + 40 = \frac{2335}{52}$$

or 44.9

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1c Outlier  $Q_3 + 1.5 \times IQR$

$$58.9 + 1.5 \times (58.9 - 27.3)$$

$$= 106.3$$

Oldest passenger in the 80-90 age range  
therefore not an outlier.

3 a Systematic sampling

b (i) Daily mean wind speed  
(ii) Light

c Variable A occurs the most often,  
note type in one of the questions with only  
15 of variable A.

$$4 \text{ (a) } R \sim B(18, 0.14)$$

$$b(i) P(R=1) = 0.1940323805$$

$$(ii) 1 - P(R \leq 3) = 0.2381588527$$

(c) Probability of success needs to be constant, so there needs to be enough beads so that when 18 are removed the probability of success remains constant

$$(d) \quad H_0: P = 0.14$$

$$H_1: P \neq 0.14$$

$$X \sim B(75, 0.14) \quad 5\% \quad 2 \text{ tail}$$

$$P(X \leq 4) = 0.0150617202$$

$$\text{So as } 0.015 < 0.025$$

Reject  $H_0$ , there is evidence that the probability of success has reduced.

(e) The  $p$  value is the probability of getting a result as extreme or more so of the observed result. So need to take into account both sides of the distribution

$$P \text{ value} = 0.015 \times 2 = \underline{\underline{0.03}}$$

(5)

	R	Y	G
A	4	3	n

B	5	3	1
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$A \rightarrow B \rightarrow A$

Prob A            333    OR    444            P

If  $n=2$      $P = \frac{4}{9} \times \frac{4}{10} = \frac{4}{90} = \frac{2}{45}$

$n=5$      $P = \frac{5}{12} \times \frac{3}{10} = \frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$