Homework 13B – Solutions

1)

(a)

$\frac{25}{60}$	B1	oe $\frac{5}{12}$ or $0.41\dot{6}$ or $41.\dot{6}\%$
Additional Guidance		
For all parts of this question, do not accept an answer in ratio form, although it is possible that the M mark in 2(c) could come from a ratio.		
For all parts of this question, ignore descriptive words such as 'likely'.		
For all parts of this question, ignore incorrect attempts to cancel a correct fraction or convert it to decimal or percentage form.		
For all parts of this question, accept an answer given in words if it is also seen in a correct format.		

(b)

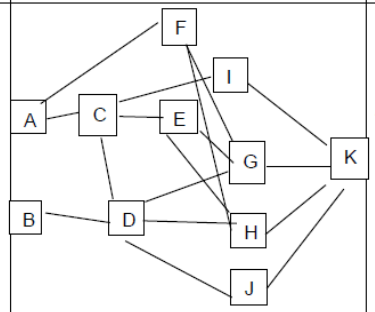
$\frac{11}{60}$	B1	oe $0.18\dot{3}$ or $18.\dot{3}\%$
Additional Guidance		
If otherwise correct answers to (a) and (b) are only given in words withhold the first mark only. For example, '25 in 60' in (a) and '11 in 60' in (b)	B0B1	

(c)

$\frac{6}{60}$ or 6 or 9 seen	M1	excluding 9 seen in $\frac{9}{10}$
$\frac{9}{60}$	A1	oe $\frac{3}{20}$ or 0.15 or 15%
Additional Guidance		

4

2)

Q	Solution	Mark	Total	Comment
1a		M1 A2,1,0	3	Sca, network diagram with 11 activities, all connected -1 for each independent error

b

Activity	Early	Late
A	0	6
B	0	11
C	6	9
D	9	12
E	9	12
F	6	12
G	12	15
H	12	15
I	9	15
J	10	15
K	15	16

M1 Sca forward pass, correct at *G* or *H*

A1 Forward pass all correct

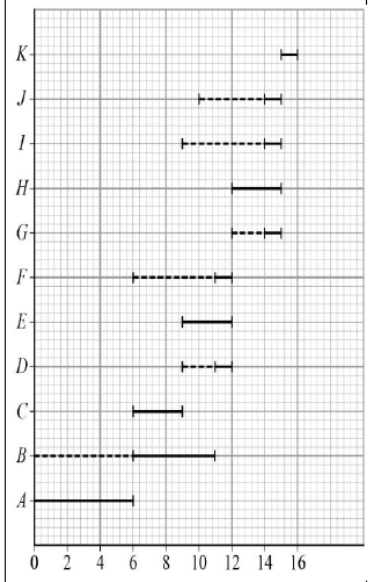
M1 Sca back pass, correct at *D* or *E*

A1F Back pass all correct ft

4

c *ACEHK* — B1 — 1 — no ft – CAO

d



M1 SCA, at least 10 activities shown, (with or without floats)
(For the **M1**, a Gantt diagram, there are only 2 correct possibilities; all activities on a separate row, or the critical path on one row, and the other activities on separate rows but we will condone two activities on the same row (in addition to the critical path) eg *B, D or F* followed by *G*.)

See graphs shown.

B1 Use of floats must be **before** the activities (at least 2 correct) for **B1.**
If the floats are after the activity, then this scores B0 and hence A0.

A1 All correct

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e 17 — B1
ACDHK — B1
2

Total 13

13

Homework 13B – Solutions

3)

on	Solution	Marks	Total	Comments
(a)	£65 = 13.4% of ticket	B1	1	if used correctly
	ticket cost $= £65 \times \frac{100}{13.4}$	M1	1	do NOT accept 100/13.4 and then multiplied by 65 unless obtaining one of below answers accept £485.08, £485
	= £485.07	A1	1	SC2 for others in range £485.04 - £485.11
(b)	cost is $£\frac{192}{1.61}$	M1	1	
	= £119.2546	A1	1	
	= £119.25	A1	1	SC2 £119, £120, £119.26 do NOT accept 1/1.61 and then multiplied by 192 unless obtaining one of above answers
(c)	ratio of 4:3 = 7 parts	B1	1	for 7 parts; seen or implied
	Kate pays $\$84 \times \frac{4}{7}$	M1	1	must be division by 7
	= $48	A1	1	SC2 for 36 or 36 and 48 Condone £ for $

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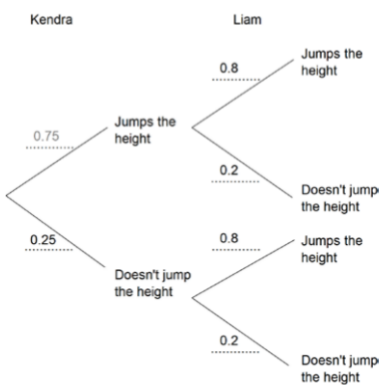
4)

(a)	Completely correct tree diagram  	B2	oe B1 for 0.25 for Kendra or 0.8 with 0.2 on one pair of Liam's branches in either order
(b)	0.75 × their 0.8	M1	oe 0 < their 0.8 < 1
	0.6	A1 ft	oe Follow through from (a) provided that 0 < their 0.8 < 1 Do not penalise subsequent change of form
(c)	0.75 × their 0.2 or 0.15 or their 0.25 × their 0.8 or 0.2	M1	Their probabilities should be in the interval (0, 1)
	their 0.15 + their 0.2 + their (b)	M1 dep	Dependent on previous M mark
	0.95	A1 ft	oe Follow through from their (a) and (b) provided that their answer is in the interval (0, 1)

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5)

	Solution	Marks	Total	Comments
(a)	Mean = 5.02	B1		
	A correct method seen	M1,		
	SD = 2.53 from 2.53239127	A1	3	also accept 2.40 from 2.4024373
(b)	2000-2009 mean is much greater than 1980-1989 mean	B1ft		ft their mean if 4 < their mean <6.01
	The prices from 2000-2009 are (much) more variable	B1ft	2	ft their s.d. > 0.678
(c)	365,000	B1	1	
	Total		**6**	

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Homework 13B – Solutions

TOTAL: 56

Godalming College

6)

ion er	Answer	Additional guidance	Mark
(a)	B1B1 Any two from: • Repeated random numbers • Random numbers out of range/may not correspond to students' numbers • Selected students may not (want to) participate • Some students may have left the university	B1 for each bullet point up to a maximum of 2 Accept each bullet point only once Students may have joined the university is B0. There may not be 100 students at the university is B0. Random numbers may not be whole numbers is B0. Database may not be up to date on its own is B0. Do not accept (random) numbers may be more than 100 for the second bullet point. Ignore extraneous non-contradictory comments.	(2)
(b)	B1B1 Any two advantages from: • Easy/convenient/quick/efficient/cheap • Represents population (proportions) • Allows for comparison (between undergraduates and postgraduates) • No sample frame required	B1 for each bullet point up to a maximum of 2 Accept each bullet point only once For 2nd bullet point allow e.g. 'fair number of each (group)' 'Unbiased' on its own is B0. Ignore extraneous non-contradictory comments.	(2)
(c)	B1 Any one from: • Not every student has an equal(o.e.) chance of being selected • Only those in the main building can be selected/not every student has a chance of being selected • Robert is choosing the students	B1 for a reason which states or implies 'equal likelihood' of being selected or that Robert is doing the choosing Do not allow 'even' chance or 'its biased' for the first bullet point, but condone 'fair chance'.	(1)

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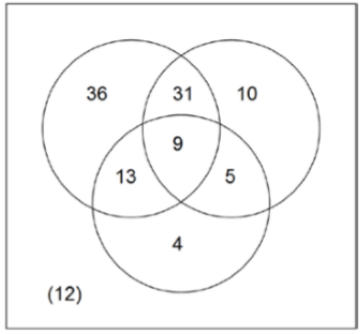
7)

All seven correct.



B4

B3 4, 5 or 6 correct

B2 2 or 3 correct

B1 1 correct

Additional Guidance

(a) Note that a number is not required in the region outside of the 3 circles for full marks in part (a)

12	B1ft	ft from an entry in their diagram or as 120 – sum of their 7 entries

Additional Guidance

(b)

Common error 1
An answer of 21 scores B1ft

Common error 2
A student could only score here if they have a number recorded outside the circles in part (a) and enter this as their answer to (b). It must be a positive number of 0

$\frac{14}{120}$	B2 ft	oe The follow through is for the numerator only. For an award of B2ft, the final answer must lie in the interval (0, 1) B1ft for their 9 + their 5 provided that both numbers are greater than 0 and whole numbers.

(c) (i)

Additional Guidance

Equivalents include $\frac{7}{60}$, $0.11\dot{6}$ and equivalent percentages.

For $0.11\dot{6}$, accept 0.12 or an answer to 3 or more significant figures (rounded or truncated).

$\frac{98}{120}$	B2 ft	oe The follow through is for the numerator only. For B2 ft to be awarded, the answer must lie in the interval (0, 1) 27 + 40 + 13 + 9 + 4 + 5 B1ft or 89 + 5 + 4 B1ft or 31 + 36 + 31 B1ft or 89 + 31 – 22 B1ft or 120 – 10 – 12 B1ft

(c) (ii)

Additional Guidance

89 + 31 = 120 B0

Equivalents include $\frac{49}{60}$, $0.81\dot{6}$ and equivalent percentages

For $0.81\dot{6}$, accept 0.82 or an answer to 3 or more significant figures (rounded or truncated).

$\frac{22}{89}$	B2ft	oe 22 or their 9 + their 13 B1ft or 89 as denominator B1ft

(c) (iii)

Additional Guidance

Follow through numerator as their 13 + their 9
Follow through denominator as the sum of the four values in the Clothing circle

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