core:maths
A NEW QUALIFICATION FOR WORK, STUDY & LIFE

Homework 9B

Godalming College

You have one week to complete this. What you hand in should be your best work, and you must attempt every question.

If you are stuck then please either consult notes or textbooks, attend a workshop, or ask your teacher.

You may need to refer to the formula book, found here:

or financial information, found here:

1) A mathematics textbook is to be written.

The work involved has been divided into a number of tasks, as shown in the table below. The minimum time required to complete each task is also shown.

Activity	Immediate predecessor	Duration (weeks)
A: Author writes first draft	–	4
B: Editor comments on first draft	A	3
C: Typesetter produces first draft	A	5
D: Author writes second draft	B, C	2
E: Editor checks second draft	D	1
F: Assessor works examples and exercises	D	1
G: Second assessor works examples and exercises	D	2
H: Author writes final draft	E, F, G	1
I: Typesetter produces final draft	H	2
J: Proof reader checks final draft	H	1
K: Books are printed	I, J	2

(a) Construct an activity network for the project. *(3 marks)*

(b) Find the earliest start time for each activity. *(2 marks)*

(c) Find the latest finish time for each activity. *(2 marks)*

(d) List the critical path. *(1 mark)*

(e) On the grid on page 5, draw a Gannt (cascade) diagram, assuming each activity starts as early as possible. *(3 marks)*

2) In 2012, the cost of a ticket from Ipswich to Lowestoft was £11.69.
In January 2013, the cost of this ticket increased by 4.4%.

What was the cost of this ticket after the increase?

[3 marks]

3) Mark invests £3000 for three years in an easy-access savings account. This account has an AER of 1.45%, which does not include a bonus. The interest is paid at the end of each year.

How much interest will this investment gain, assuming that the interest rate stays the same during this period?

[3 marks]

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4) A house is to have new carpets fitted throughout. The work involved has been divided into a number of tasks, as shown in the table.

Activity	Immediate predecessor	Duration (hours)
A: Remove old carpets upstairs	–	0.5
B: Remove old grippers upstairs	A	0.2
C: Remove old carpets downstairs	–	1
D: Remove old grippers downstairs	C	0.3
E: Fit new grippers upstairs	B	0.7
F: Fit new grippers downstairs	D	0.9
G: Lay underlay	E, F	2
H: Fit new carpets	G	4.5
I: Fit doorplates upstairs	H	0.6
J: Fit doorplates downstairs	H	0.7
K: Clean	I, J	0.5

(a) Construct an activity network for the project. *(3 marks)*

(b) Find the earliest start time for each activity. *(2 marks)*

(c) Find the latest finish time for each activity. *(3 marks)*

(d) Find the critical activities and state the length of the critical path. *(2 marks)*

(e) On the grid given on the answer sheet, construct a Gantt (cascade) diagram for the project. *(3 marks)*

5) (a) Prem is planning his 21st birthday, it will be from 8pm to midnight at the local village hall. He wants to invite 100 friends, and he will provide the drinks. How many drinks should he provide?

(b) How much money do you estimate this will cost?

(c) How might changing one of your assumptions affect your answer to part (b)?

6) There are 142 732 households in Northumberland as a whole.
The table shows the percentages of different types of household in each area of Northumberland and in Northumberland as a whole.

	Detached house or bungalow (%)	Semi-detached house or bungalow (%)	Terrace (%)	Flat (%)	Caravan or other temporary structure (%)
Alnwick	30.62	32.20	27.41	9.62	0.15
Berwick-upon-Tweed	24.80	34.47	28.97	11.50	0.27
Blyth Valley	15.12	44.69	26.99	13.11	0.03
Castle Morpeth	38.10	32.80	21.98	7.01	0.10
Tynedale	33.49	31.28	26.52	8.44	0.27
Wansbeck	14.65	33.69	39.90	11.62	0.13
Northumberland as a whole	24.58	35.85	28.93	10.49	0.14

(a) Explain why the percentages for Berwick-upon-Tweed do not sum to 100. *(1 mark)*

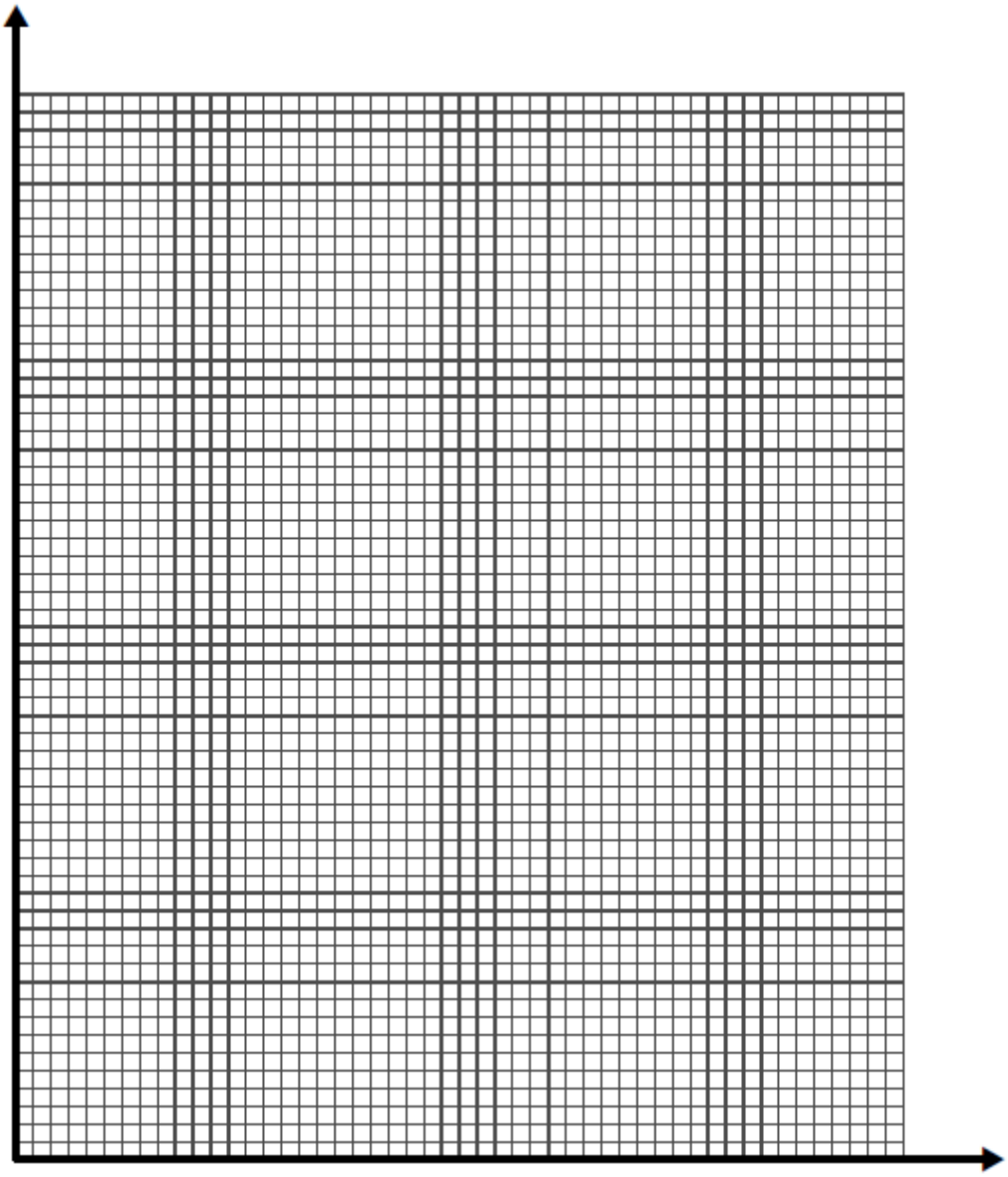
(b) Calculate the number of 'detached houses or bungalows' in Northumberland as a whole. *(2 marks)*

(c) There were 2990 flats in Wansbeck. Calculate how many households there are in Wansbeck. *(3 marks)*

(d) Castle Morpeth has the greatest percentage of 'detached houses or bungalows'. Does this necessarily mean that Castle Morpeth has the greatest number of 'detached houses or bungalows' when compared with the other areas of Northumberland? Give a reason for your answer. *(2 marks)*

Homework 9B – Answer sheet

1)



Homework 9B – Answer sheet

4)