



# SPECIMEN

Advanced Subsidiary GCE (or Advanced GCE)

**G054**

**APPLIED INFORMATION AND  
COMMUNICATION TECHNOLOGY**

**Unit G054: Software Development**

**Specimen Paper**

Time: 1 hour 30 minutes

Candidates answer on the question paper.

**Additional materials:**

Pre-released materials and tasks with candidate instructions

Candidate  
Forename

Candidate  
Surname

Centre Number

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Candidate  
Number

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**INSTRUCTIONS TO CANDIDATES**

- Write your name in capital letters, your centre number and candidate number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do not write in the bar codes.
- Do not write outside the box bordering each page.
- Write your answer to each question in the space provided.

**INFORMATION FOR CANDIDATES**

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (\*).
- The total number of marks for this paper is 100.
- No marks will be awarded for using brand names of software packages or hardware.

**FOR EXAMINER'S USE**

<b>Task 2</b>	
<b>Task 3</b>	
<b>Task 4</b>	
<b>1</b>	
<b>2</b>	
<b>3</b>	
<b>4</b>	
<b>5</b>	
<b>6</b>	
<b>7</b>	
<b>8</b>	
<b>9</b>	
<b>10</b>	
<b>11</b>	
<b>12</b>	
<b>13</b>	
<b>TOTAL</b>	

This document consists of **7** printed pages and **1** blank page.

**SECTION A**

Answer **all** questions.

**This section relates to the case study on Island Fly.**

**1** One of the purposes of the proposed system is to standardise the software used.

Describe **two** other purposes of the proposed system.

Purpose 1 .....

.....

.....

Purpose 2 .....

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..... [4]

**2** The owner and staff of Island Fly have defined functional and non-functional requirements.

**(a)** Describe **one** functional requirement that has been defined by the owner.

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..... [2]

**(b)** Describe the defined non-functional requirement that relates to software.

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..... [2]

**3** Island Fly has defined process constraints.

Describe the hardware constraints that have been defined by Island Fly.

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..... [4]

4 Describe **two** problems, caused by the current system at Island Fly, that are having a direct impact on the Frequent Flyer scheme.

Problem 1 .....

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Problem 2 .....

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[4]

5 The owner of Island Fly has requested that the security of the data and information held on the computers at head office be increased.

Explain how user names and passwords could be used to achieve this.

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[6]

6 Investigations must be completed during the feasibility stage.

Describe **two** advantages of using questionnaires as an investigation method in Island Fly.

Advantage 1 .....

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.....

Advantage 2 .....

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[4]

7\* One of the user requirements is that the proposed system can adapt to any future changes in the operation of Island Fly.

Explain, using examples relating to Island Fly, the different types of maintenance strategies that can be used.

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[12]

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- 8** When the new system has been implemented the staff at Island Fly will need to be trained. Identify and explain a training strategy that could be used for staff who work in the hangar.

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[5]

- 9** The new system at Island Fly could be implemented using the phased implementation method. Explain why this method is suitable.

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[4]

- 10** Information and data about the aeroplanes needs to be stored.

Identify the most appropriate type of software for storing these records, justifying your choice.

Software .....

Justification .....

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.....

[3]

**SECTION B**

Answer **all** questions.

**You do not need the case study or your notes to answer these questions.**

**11** When a system has been developed and tested it needs to be implemented.

Describe the direct/big bang implementation method.

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..... [3]

**12** Diagrams and flowcharts can be used during the analysis and design stages of the systems lifecycle.

**(a)** Explain the function of a L0 dataflow diagram (context diagram).

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.....  
..... [4]

**(b)** Draw and label **two** components of a systems flowchart.



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OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced Subsidiary GCE (or Advanced GCE)

**APPLIED INFORMATION AND  
COMMUNICATION TECHNOLOGY**

**G054**

Unit G054: Software Development

**Specimen Mark Scheme**

The maximum mark for this paper is **100**.

SPECIMEN

This document consists of **12** printed pages.

**G054 Software development**

There are 100 marks available for this test. They are allocated as follows:

- Tasks 2, 3 and 4 30
- Section A of the test paper 50
- Section B of the test paper 20

**Task 2 (15 marks)****12 marks available for L1 DFD (See next page)**

1 mark available for each of:

Consistency of symbols - C

External Entity (passenger) identified – EE

Logical order of processes - L

1 mark for each correct process with associated flows/data stores - P (Max 9)

**Evaluation – 3 marks available**

Mark	Guidance
1	Some comment on method(s) used to develop DFD
2	A strength/weakness in method(s) used identified
3	A strength and weakness in method(s) used identified

**Task 3 (10 marks) (see next page)**

1 mark for correct structure

1 mark for correct initial condition

1 mark for all decisions shown

1 mark for correct labelling of decisions

**1 mark for each correct condition/outcome (Max 6)**

Table 2

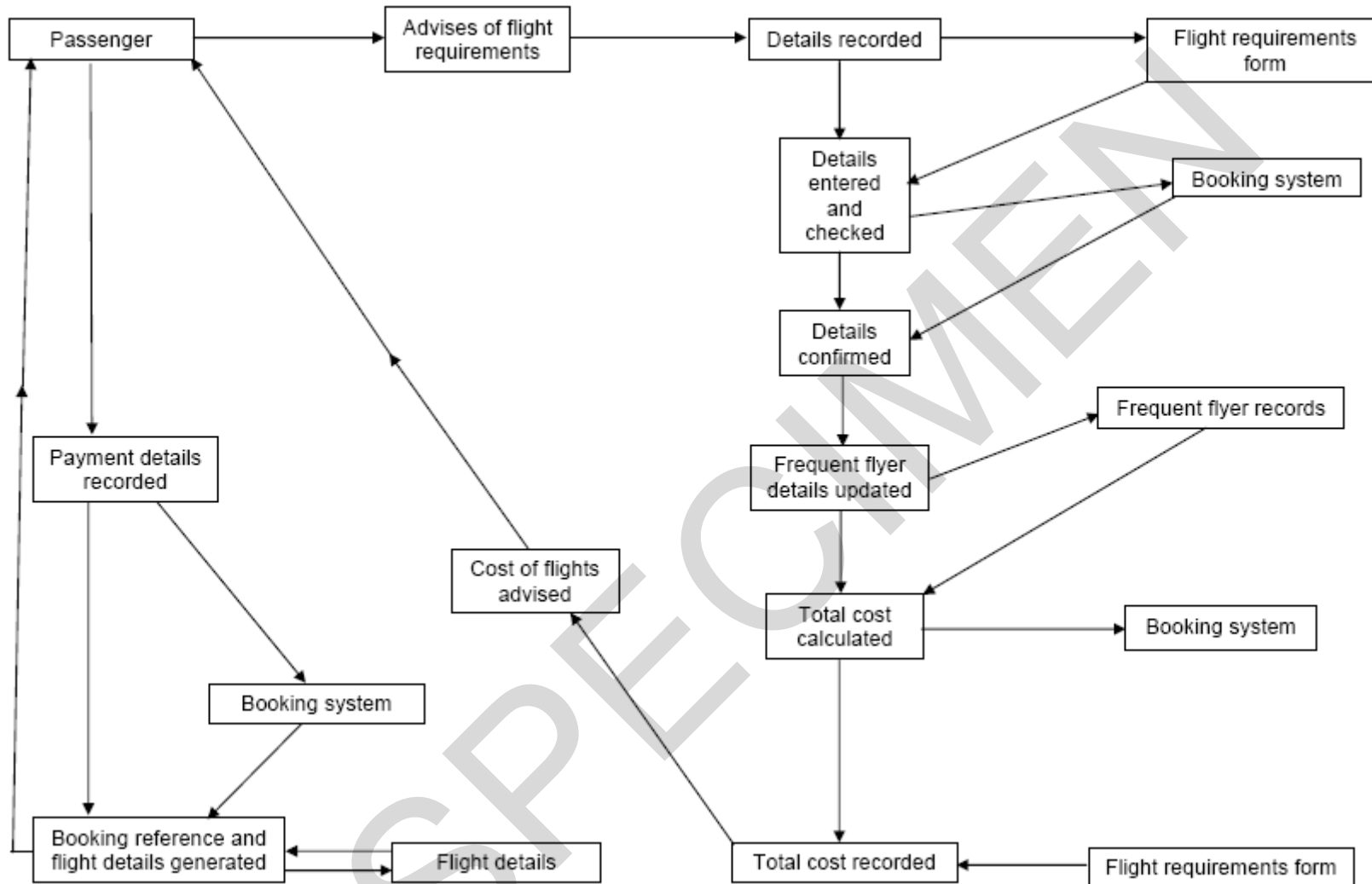
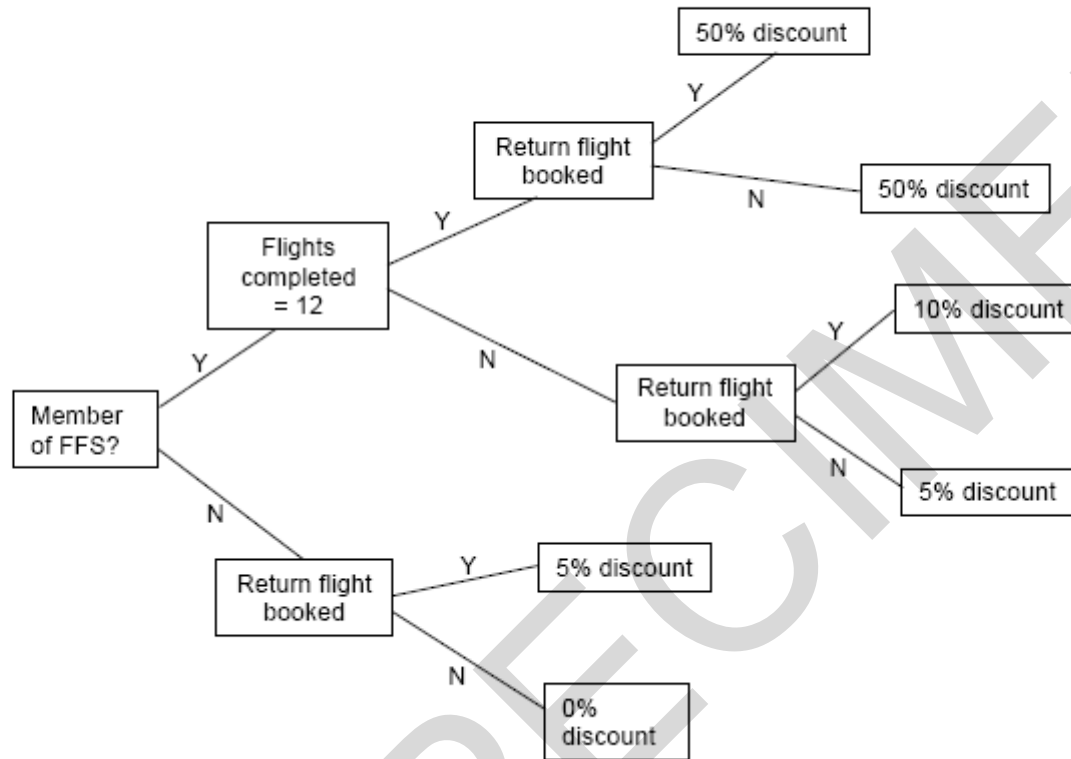


Table 3



**Task 4 (5 marks)**

1 mark each for (Max 5):

- Use of colour/font/white space
- Logical order of information on screen
- Security indication
- Clear space for passenger details
- Identification of Island Fly
- Space for Frequent Flyer scheme membership number
- All data/information shown is appropriate (eg Passenger name, address, contact number, date/time of flight, return/single, payment details/type) with no omissions/extra data required
- Use of validation/drop down boxes/option boxes/radio buttons where appropriate
- Discounts applied
- Total cost of flight
- Booking reference number

**No marks awarded for a design done within a web authoring package.**

Note: IF = Island Fly

Section A		
Question Number	Answer	Max Mark
1	<p><b>One of the purposes of the proposed system is standardise the software used.</b></p> <p><b>Describe two other purposes of the proposed system.</b></p> <p>Any 2 from, max 2 per purpose:</p> <p>To solve the problems caused by the current system (1) example of problems given (1)</p> <p>To produce reports as defined by owner of IF(1) example of reports given (1)</p> <p>To improve communication (1) between head office and hangar (1)</p> <p>To increase the security of information (1) held on the computers in head office (1).</p>	[4]
2(a)	<p><b>Describe one functional requirement that has been defined by the owner.</b></p> <p>Any 2 from:</p> <p>To produce reports (1st) on the number of bookings for each leg of the schedule/amount of revenue generated for each leg/the number of bookings for each day of the working week (1)</p> <p>To keep records relating to the Frequent Flyer scheme (1st) up-to-date (1)</p>	[2]
2(b)	<p><b>Describe the defined non-functional requirement that relates to software.</b></p> <p>Max 2</p> <p>To use the same software vendor (1st) as the current operating system (1) to provide an upgraded operating system (1)</p> <p>To standardise the applications software (1st) throughout the company (1)</p>	[2]

Question Number	Answer	Max Mark
3	<p><b>Describe the hardware constraints that have been defined by Island Fly.</b></p> <p>4 from:</p> <p>The existing computers at the head office and hangar (1st) be included into the proposed system (1)</p> <p>Provide a laptop computer (1st) for the owner (1) that has Internet access (1)</p> <p>Upgrade all peripherals (1)</p>	[4]
4	<p><b>Describe two problems, caused by the current system at Island Fly, that are having a direct impact on the Frequent Flyer scheme.</b></p> <p>Max 2 per description, any 2 from:</p> <p>Members records are not being kept up-to-date (1st) leading to incorrect discounts being given (1)</p> <p>Details of return flights taken are not being updated (1st) number of qualifying flights are incorrect (1)</p> <p>Frequent Flyer records are not linked to passenger details (1st) passenger dissatisfaction when incorrect discounts are given (1)</p>	[4]
5	<p><b>The owner of Island Fly has requested that the security of the data and information held on the computers at head office be increased.</b></p> <p><b>Explain how user names and passwords could be used to achieve this.</b></p> <p>6 from:</p> <p>Can be used to show audit trails (1) who has accessed ie data/websites (1) reduces risk of unauthorised access to system (1) must be changed regularly (1) not a recognised/memorable word/made up of letters and numbers (1)</p> <p>Used to determine access rights (1) different groups of staff/end users within IF (1) would have access to data (1) dependant on the job role they do (1) eg admin staff need access to all passenger details (1)</p>	[6]

Question Number	Answer	Max Mark
6	<p><b>Investigations must be completed during the feasibility stage. Describe two advantages of using questionnaires as an investigation method in Island Fly.</b></p> <p>Max 2 for each advantage eg:            All members of IF/large group (1) can be asked the same questions (1)            Comparisons between answers (1) easy to formulate/% can be determined (1)            More cost effective method (1) some staff of IF work long distances away from Blackpool/at The Isle of Man &amp; Belfast (1)            Can be done anonymously (1) can provide honest answers/not biased (1)</p>	[4]
7*	<p><b>Explain, using examples relating to Island Fly, the different types of maintenance strategies that can be used.</b></p> <p>Band Mark Range</p> <p>H 9 – 12 Candidates will show a clear understanding of the question and include <b>detailed</b> explanations of a range of maintenance strategies using examples relating to Island Fly.            Examples will relate to IF            The information will be presented in a structured and coherent form. There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.</p> <p>M 5 – 8 Candidates will show an understanding of the question and include explanations of a range of maintenance strategies. Explanations may be limited.            Some examples will relate to IF.            The information will be presented in a structured format. There may be occasional errors in spelling, grammar and punctuation. Technical terms will be mainly correct.</p> <p>L 1 – 4 Candidates will demonstrate a limited understanding of the question.            Examples, if given, may not relate to IF.            Information may be a list of points, with little or no explanations. Information will be poorly expressed and there will be a limited, if any, use of technical terms.            Errors of grammar, punctuation and spelling may be intrusive.</p> <p>0 marks – No response or no response worthy of credit</p> <p><b>Adaptive</b> – occurs when IF has a need that the system must fulfil. Owner already concerned about the impact of any new legislation.            Example            Also considering expanding the function of IF, can be used to incorporate secure website with on-line booking &amp; payments.</p>	[12]



Question Number	Answer	Max Mark
	<p><b>Perfective</b> – enhances the system, usually done at the request of the users/IF. Does not change the overall functionality of the system. Example Can add features to assist users, such as a macro to print a report, change in corporate style.</p> <p><b>Corrective</b> – also known as remedial maintenance, carried out if reports not as required, doesn't process data as required or specified. For example, IF may need different time scales in reports eg monthly/weekly – this will be completed if time wrong. Can be completed through use of a patch issued by developers to IF.</p> <p><b>Preventative</b> – attempts to solve problems before they occur. By completing this, the new system at IF will have the shelf-life extended. For example system has routines in place to be run automatically, virus checking of emails, disc scans, automatic back-up routines, centralised back-ups completed at a given time schedule.</p>	
8	<p><b>Identify and explain a strategy that could be used for staff who work in the hangar.</b> 1<sup>st</sup> mark for identification, up to 4 for justification.</p> <p>On-site/Training provider (1<sup>st</sup>) used if a customised off-the-shelf system is implemented (1) carried out when system has been implemented/installed (1) only need training on part of system they are going to be using (1) training needs to be specific to the new system (1) need basic IT training (1) this would be generic on basic skills (1) eg accessing Internet/email (1)</p>	[5]
9	<p><b>The new system at Island Fly could be implemented using the phased implementation method.</b> <b>Explain why this method is suitable.</b> 4 from:</p> <p>Requires selected parts of organisation to use new system (1) IF have three main parts to organisation (1) could be installed in Admin office initially (1) most records held here (1) when the system works (1) then installed at offices at The Isle of Man/Belfast (1) and the hangar (1)</p>	[4]

Question Number	Answer	Max Mark
10	<p><b>Identify the most appropriate type of software for storing these records, justifying your choice.</b></p> <p>Database (1<sup>st</sup>) can be relational (1) so updates are global (1) no redundant data (1)</p>	[3]
<b>Section B</b>		
11	<p><b>Describe the direct/big bang implementation method.</b></p> <p>The riskiest implementation method (1) new system completely replaces old system (1) on a given day (1) any problems can lead to data loss (1) should be used during a quiet time in the business (1)</p>	[3]
12(a)	<p><b>Explain the function of a L0 dataflow diagram (context diagram).</b></p> <p>4 from:</p> <p>shows the entire system (1) as a single process (1) details data flows (1) between the system and the external entities (1) fixes boundaries of the system (1)</p>	[4]
12(b)	<p><b>Draw and label two components of a systems flowchart.</b></p> <p>Any 2 from: symbol and label must match</p> <p>Report/document/form/output (1) correct symbol (1) Process or operation (1) correct symbol (1) Decision (1) correct symbol (1) Data store (1) correct symbol (1) Flow of data/information (1) correct symbol (1)</p>	[4]

Question Number	Answer	Max Mark
13*	<p><b>Evaluate the use of rich picture diagrams as a tool in the systems life cycle.</b></p> <p>Band Mark Range</p> <p>H 7 – 9 Candidates will show a clear understanding of the question and include <b>detailed</b> explanations of the advantages <b>and</b> disadvantages of the use of rich picture diagrams. Candidates provide a conclusion clearly justifying the use of rich picture diagrams as a tool in the systems life cycle. The information will be presented in a structured and coherent form. There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.</p> <p>M 4 – 6 Candidates will show an understanding of the question and include explanations of the advantages <b>and</b> disadvantages of the use of rich picture diagrams. Explanations may be limited. Candidates provide a conclusion relating to the use of rich picture diagrams as a tool in the systems life cycle. This may be limited in scope. The information will be presented in a structured format. There may be occasional errors in spelling, grammar and punctuation. Technical terms will be mainly correct.</p> <p>L 1 – 3 Candidates will demonstrate a limited understanding of the question. Information may be a list of advantages <b>or</b> disadvantages, with little or no explanations. Information will be poorly expressed and there will be a limited, if any, use of technical terms. Errors of grammar, punctuation and spelling may be intrusive.</p> <p>0 marks – No response or no response worthy of credit</p> <p><b>Responses may include:</b></p> <p><b>Advantages</b>  Provides an overview at the beginning of the investigation process  Shows the important processes and links on 1 side of A4 paper  Easily understood by clients</p> <p><b>Disadvantages</b>  System can be too complicated (to fit on 1 side of A4 paper)  Staff can describe the processes in too much detail analyst may find it difficult to select important processes  May over-simplify the system being analysed</p>	[9]
<b>Paper Total</b>		<b>[100]</b>

## Assessment Objectives Grid (includes QWC\*)

Question	AO1	AO2	AO3	AO4	Total
Task 2		6	6	3	15
Task 3	2		8		10
Task 4			5		5
1			4		4
2(a)		2			2
2(b)		2			2
3			4		4
4			4		4
5		6			6
6	4				4
7		6		6	12
8				5	5
9	4				4
10		3			3
11			3		3
12(a)		4			4
12(b)		4			4
13*			3	6	9
<b>Totals</b>	<b>10</b>	<b>33</b>	<b>37</b>	<b>20</b>	<b>100</b>