



Rewarding Learning

General Certificate of Secondary Education  
January 2014

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Candidate Number

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StudentBounty.com

## Mathematics

Unit T2

(With calculator)



Foundation Tier

ML

[GMT21]

FRIDAY 10 JANUARY, 9.15 am–10.45 am

### TIME

1 hour 30 minutes, plus your additional time allowance.

### INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

**You must answer the questions in the spaces provided.**

Complete in blue or black ink only.

Answer **all twenty-nine** questions.

Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

You **may** use a calculator for this paper.

### INFORMATION FOR CANDIDATES

The total mark for this paper is 100.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Functional Elements will be assessed in this paper.

Quality of written communication will be assessed in **questions 1 and 16(b)**.

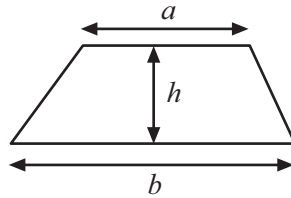
You should have a calculator, ruler, compasses and a protractor.

The Formula Sheet is on page 2.

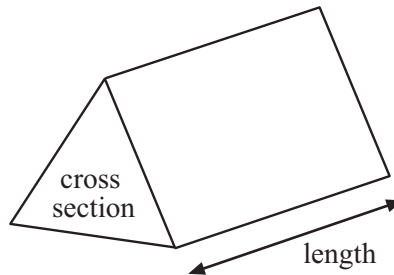
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# Formula Sheet

$$\text{Area of trapezium} = \frac{1}{2}(a + b)h$$



$$\text{Volume of prism} = \text{area of cross section} \times \text{length}$$







4

Year	2008	2009	2010	2011	2012
Rainfall (cm)	60.5	62.5	62.0	61.0	

The mean rainfall over these 5 years was 62 cm. What was the rainfall in 2012?

Answer \_\_\_\_\_ cm [3]

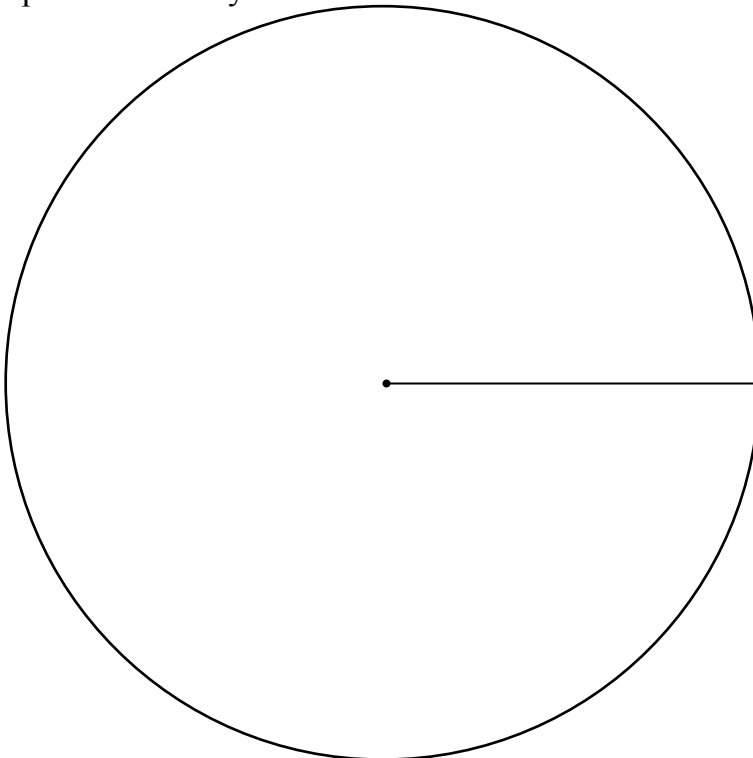
Examiner Only

Marks	Remark
Total Question 4	
Total Question 5	

- 5 Look at the table below. It shows the number of pairs of shoes of different colours that are sold in a shop in one day.

Colour	Black	Brown	Blue	Other
Number	35	20	18	17
Angle				

Fill in the pie chart to show the number of pairs of shoes of each colour. Label the pie chart clearly.



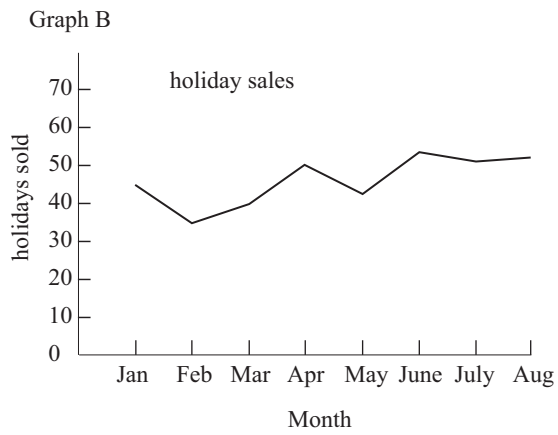
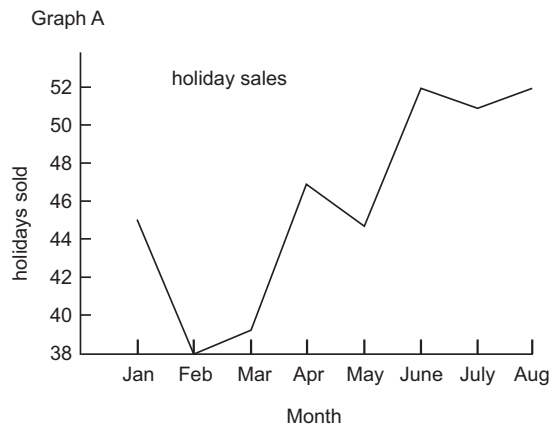
[4]

Total Question 5

[Turn over]

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6 Look at the two graphs below. They show the same information but they look different.



(a) Which graph appears to show the biggest increase in sales?

Answer Graph \_\_\_\_\_ [1]

(b) Why does this graph make you think this?

Answer \_\_\_\_\_ [1]

Examiner Only	
Marks	Remark
Total Question 6	

7 Calculate the size of angle  $x$  in the diagram below.

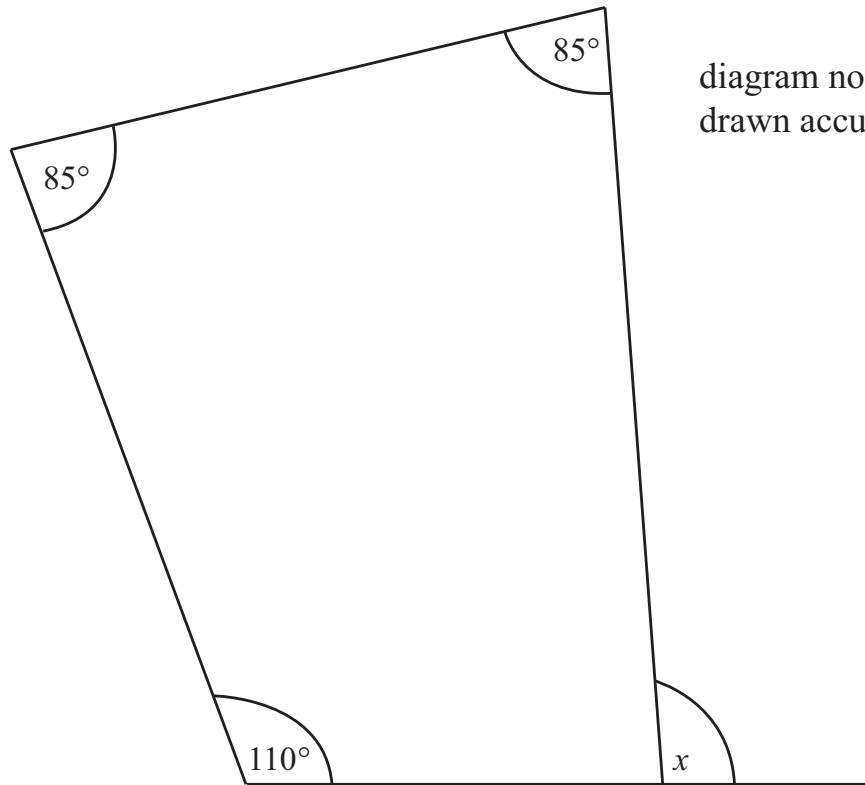


diagram not  
drawn accurately




Answer  $x =$  \_\_\_\_\_ $^\circ$  [3]

Examiner Only

Marks Remark

Total Question 7

[Turn over

	1000			1300			1600		
Dublin Connolly									
Newry 	1112			1412			1712		
Poyntzpass									
Scarva									
Portadown	0845 0945 1045	1134 1145	1245 1345	1434 1445	1545 1645	1734 1745	1845		
Lurgan	0851 0951 1051	1144 1151	1251 1351		1451 1551 1651		1751 1851		
Moirá	0857 0957 1057		1157 1257 1357		1457 1557 1657		1757 1857		
Lisburn	0910 1010 1110	1203 1210	1310 1410		1510 1610 1710		1810 1910		
Hilden	0912 1012 1112		1212 1312 1412		1512 1612 1712		1812 1912		
Lambeg	0914 1014 1114		1214 1314 1414		1514 1614 1714		1814 1914		
Derríaghá	0916 1016 1116		1216 1316 1416		1516 1616 1716		1816 1916		
Dunmurry	0919 1019 1119		1219 1319 1419		1519 1619 1719		1819 1919		
Finaghá	0922 1022 1122		1222 1322 1422		1522 1622 1722		1822 1922		
Balmoral	0924 1024 1124		1224 1324 1424		1524 1624 1724		1824 1924		
Adelaide	0926 1026 1126		1226 1326 1426		1526 1626 1726		1826 1926		
Great Victoria Street	0930 1030 1130		1230 1330 1430		1530 1630 1730		1830 1930		
Great Victoria Street	0834 0934 1034 1134		1234 1334 1434		1534 1634 1734		1834 1934		
City Hospital	0837 0937 1037 1137		1237 1337 1437		1537 1637 1737		1837 1937		
Botanic	0839 0939 1039 1139		1239 1339 1439		1539 1639 1739		1839 1939		
Belfast Central 	0842 0942 1042 1142	1216 1242	1342 1442	1507 1542	1642 1742	1807 1842	1942		
Belfast Central	0845 0945 1045 1145	1245 1345 1445	1545 1645 1745	1845	1945				
Titanic Qtr (Bridge End)	0848 0948 1048 1148	1248 1348 1448	1548 1648 1748	1848	1948				
Sydenham 	0851 0951 1051 1151	1251 1351 1451	1551 1651 1751	1851	1948				
Hollywood	0855 0955 1055 1155	1255 1355 1455	1555 1655 1755	1855	1955				
Marino	0857 0957 1057 1157	1257 1357 1457	1557 1657 1757	1857	1957				
Cultra	0859 0959 1059 1159	1259 1359 1459	1559 1659 1759	1859	1959				
Seahill	0902 1002 1102 1202	1302 1402 1502	1602 1702 1802	1902	2002				
Helen's Bay	0905 1005 1105 1205	1305 1405 1505	1605 1705 1805	1905	2005				
Carnalea	0909 1009 1109 1209	1309 1409 1509	1609 1709 1809	1909	2009				
Bangor West	0911 1011 1111 1211	1311 1411 1511	1611 1711 1811	1911	2011				
Bangor	0916 1016 1116 1216	1316 1416 1516	1616 1716 1816	1916	2016				

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Look at the timetable above.

- (a) Sarah takes the 1134 train from Portadown to Belfast Central.  
How long should the journey take?

Answer \_\_\_\_\_ minutes [1]







10 (a) Simplify

$$5x + 2y - 3x - 5y$$

Answer \_\_\_\_\_ [2]

(b) Solve

$$7x - 3 = 18$$

Answer  $x =$  \_\_\_\_\_ [2]

(c) Solve

$$\frac{x}{20} = 2$$

Answer  $x =$  \_\_\_\_\_ [1]

Examiner Only

Marks Remark

Total Question 10

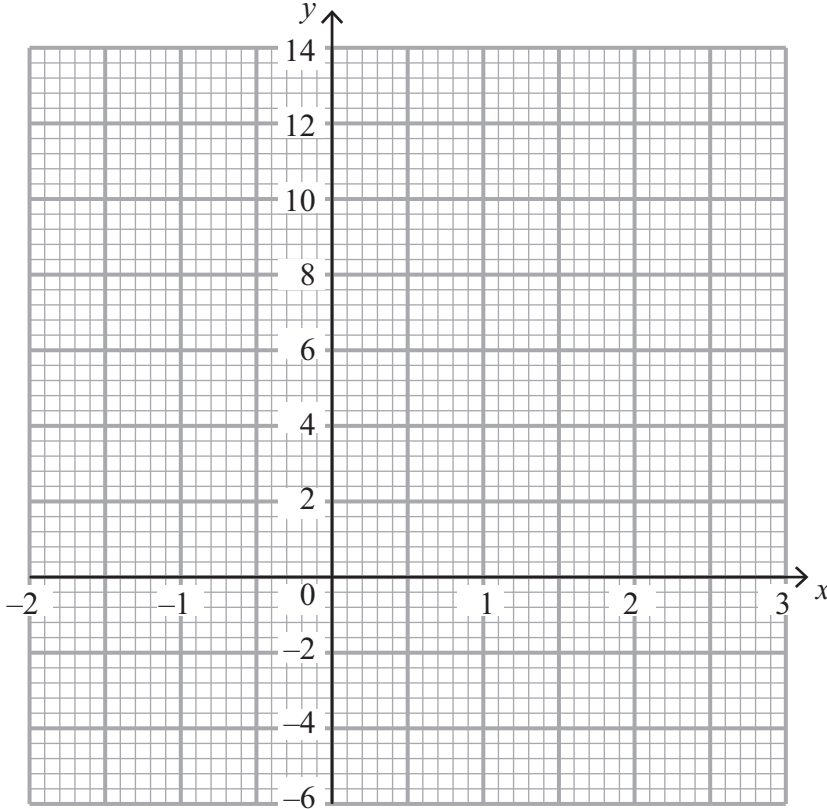
[Turn over

11 (a) Complete the table of values for the equation  $y = 3x + 5$

$x$	-2	-1	0	1	2	3
$y$	-1		5	8		14

[1]

(b) Draw the graph of  $y = 3x + 5$   
between  $x = -2$  and  $x = 3$   
Do this on the grid below.



[2]

(c) Draw the line  $x = 2$  on the same grid.

[1]

Examiner Only	
Marks	Remark
Total Question 11	



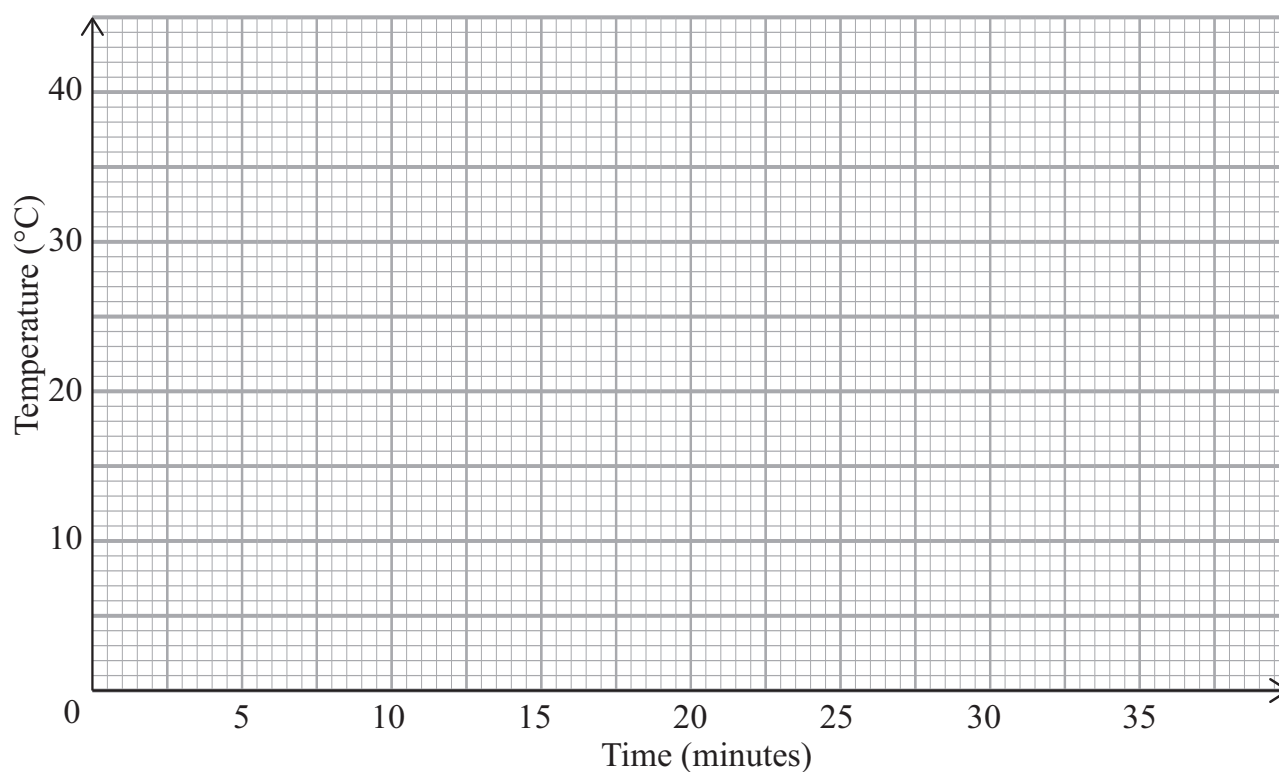
14 Look at the table below. It shows the temperature of some liquids as they cool in a freezer.

Time (minutes)	5	10	15	18	25	30	30
Temperature ( $^{\circ}\text{C}$ )	35	31	24	22	12	7	6

Examiner Only	
Marks	Remark

(a) Draw a scatter graph for this data.

[2]



(b) Draw a line of best fit.

[1]

(c) Estimate the time taken for a liquid to reach freezing point ( $0^{\circ}\text{C}$ ).

Answer \_\_\_\_\_ minutes [1]

Examiner Only	
Marks	Remark

(d) Describe the correlation.

Answer \_\_\_\_\_ [1]

Examiner Only	
Marks	Remark
Total Question 14	
Total Question 15	

**15** Twenty two pupils recorded the time (in minutes) they spent on their homework last Monday night. Their times are listed below.

40    55    80    60    50    55    65    40    120    100    90  
 55    60    110    100    120    75    50    80    85    60    45

Construct a stem and leaf diagram to show this data.

[3]





17 The radius of the base of a cylindrical oil tank is 60 cm.

(a) Calculate the area of the base of the oil tank.

Answer \_\_\_\_\_ cm<sup>2</sup> [2]

The height of the oil tank is 70 cm.

(b) Calculate the volume of the oil tank. Give your answer in **litres**.

Answer \_\_\_\_\_ litres [3]

Examiner Only

Marks Remark

Total Question 17

[Turn over

**18** Angela buys 5 DVDs and 4 CDs.  
 Each DVD costs  $d$  pounds. Each CD costs  $c$  pounds.  
 Write down an expression for the total cost.

Examiner Only	
Marks	Remark
Total Question 18	

Answer \_\_\_\_\_ [2]

**19** The  $n^{\text{th}}$  term of a sequence is given by  $n^2 - 1$

**(a)** Write down the first 3 terms of this sequence.

Answer \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ [2]

**(b)** Explain why 101 cannot be a term in this sequence.

Answer \_\_\_\_\_ [1]

Total Question 19	

**20** Solve  $7e + 3 = 4e + 5$

Answer  $e =$  \_\_\_\_\_ [3]

Total Question 20	

21 (a) Express 84 as a product of its prime factors in index form.

Answer \_\_\_\_\_ [3]

(b) Find the Lowest Common Multiple (LCM) of 63 and 84

Answer \_\_\_\_\_ [2]

Examiner Only

Marks Remark

Total Question 21

22 The weight of a cow increases from 147 kg to 165 kg.

What is the percentage increase in the weight of the cow?

Answer \_\_\_\_\_ % [3]

Total Question 22







28 Expand and simplify  $3(2w - 1) - 2(w - 4)$

Answer \_\_\_\_\_ [2]

Examiner Only

Marks Remark

Total Question 28

29 Use the method of trial and improvement to find the solution to the equation  $x^3 + 3x = 47$

Give your answer correct to 1 decimal place.

Show each step of your working out.

Answer  $x =$  \_\_\_\_\_ [4]

Total Question 29

**THIS IS THE END OF THE QUESTION PAPER**

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**DO NOT WRITE ON THIS PAGE**

For Examiner's use only	
Question Number	Marks
1	
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<b>Total Marks</b>	
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**Examiner Number**

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