Level 1/Level 2 Certificate
Higher Level
June 2015

Use of Mathematics 43503H/PM

Core unit

Preliminary Material

Data Sheet

To be opened and issued to candidates between Monday 27 April 2015 and Monday 11 May 2015

REMINDER TO CANDIDATES

YOU MUST **NOT** BRING THIS DATA SHEET
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A CLEAN COPY WILL BE MADE AVAILABLE.

INFORMATION

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There are no data printed on this page

Train services

Part of the weekday timetable for trains from Ipswich to Felixstowe and Lowestoft, for 9 December 2013 to 16 May 2014, is shown.

Ipswich – Felixstowe – Lowestoft

Mondays to Fridays
9 December to 16 May

		1				1				1
Harwich International	**d**	.	.	.	.	.	.	.	.	.
Ipswich	**d**	15 17	15 54	15 58	16 58	17 17	17 58	18 13	18 58	19 17
Westerfield	**d**	.	16 00	16 04	17 04	.	18 04	18 19	19 04	.
Derby Road	**d**	...	...	16 09	17 09	...	18 09	...	19 09	...
Trimley	**d**	.	.	16 18	17 18	.	18 18	.	19 18	.
Felixstowe	**a**	...	...	16 24	17 24	...	18 24	...	19 24	...
Woodbridge	**d**	15 32	16 18	.	.	17 32	.	18 30	.	19 32
Melton	**d**	15 36	16 22	...	...	17 36	...	18 34	...	19 36
Wickham Market	**d**	15 43	16 29	.	.	17 43	.	18 40	.	19 43
Saxmundham	**d**	15 54	16 40	...	...	17 54	...	18 51	...	19 54
Darsham	**d**	16 00	16 47	.	.	18 00	.	18 58	.	20 00
Halesworth	**d**	16 10	16 56	...	...	18 10	...	19 07	...	20 10
Beccles	**d**	16 25	17 19	...	...	18 25	...	19 25	...	20 25
Oulton Broad South	**d**	16 35	17 28	.	.	18 35	.	19 35	.	20 35
Lowestoft	**a**	16 43	17 36	...	...	18 43	...	19 43	...	20 43

Key to symbols:
a Arrival time
d Departure time
1 First Class service

On 2 January each year, train service operators increase their rail fare prices. Different operators increase their prices by different percentages.

Turn over

Air temperature

Weather stations record many measurements of weather conditions, such as wind speed and direction, rainfall and air temperature. There are more than 200 weather stations around the United Kingdom.

A typical weather station

Weather stations in Glasgow and London record air temperatures each day.

The table shows the lowest and highest temperatures for every day of one week in March 2013 in Glasgow.

	Glasgow	
Day	**Lowest temperature (°C)**	**Highest temperature (°C)**
Sunday	5	8
Monday	−1	8
Tuesday	−3	9
Wednesday	3	6
Thursday	5	7
Friday	4	5
Saturday	2	4

Over the thirty-year period from 1981 to 2010, the lowest and highest mean monthly temperatures for London were recorded. The table below shows these data.

	London	
Month	**Lowest mean temperature (°C)**	**Highest mean temperature (°C)**
January	3.1	8.1
February	2.7	8.6
March	4.6	11.6
April	5.9	14.6
May	8.9	18.1
June	11.8	21.0
July	13.7	23.4
August	13.8	23.1
September	11.4	20.0
October	8.8	15.5
November	5.8	11.3
December	3.4	8.4

Temperature can be measured in degrees Fahrenheit, F, or degrees Celsius, C. These are connected using the two formulae below.

$$F = \frac{9}{5}C + 32$$

$$C = \frac{5}{9}(F - 32)$$

Turn over

Road signs and road safety

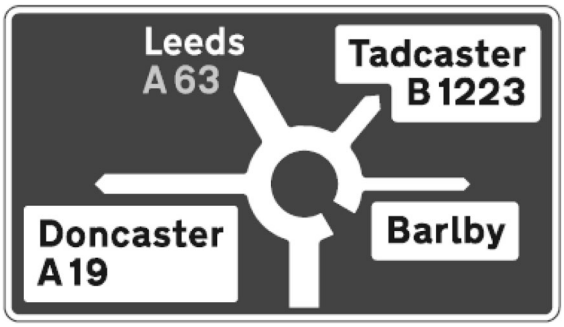
No right turn

Road signs are used to give information or instructions to road users. Road signs giving instructions are usually there to maintain road safety.

Some road signs are circular. The shape of other road signs may be modelled by triangles or rectangles. Examples of each are shown below.

No motor vehicles

Bend to right



Roundabout ahead

Road signs are made in different sizes. The size of a sign depends on the speed limit of the road. Signs on motorways are larger than signs on other roads.

A GIVE WAY sign may be seen in one of five sizes. These are shown below.

Speed limit (mph)	Size of GIVE WAY sign (x cm)
Up to 30	60
40	75
50	90
60	120
70	150

You can often see traffic cones around roadworks. When the base is ignored, the cone can be modelled by a cone with its top removed. The resulting solid shape is called a frustum.

Turn over

Delivery charges

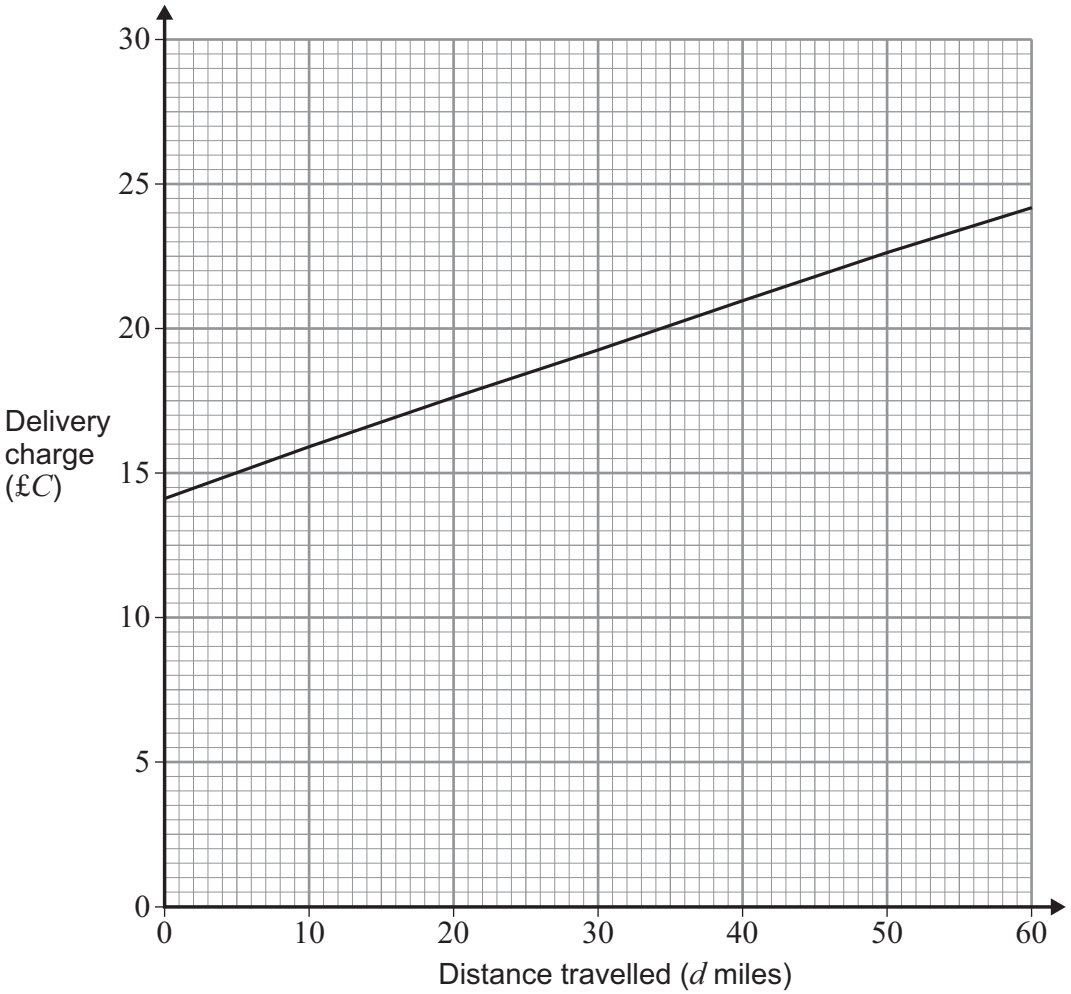
The delivery charge for a courier service often includes a fixed cost, £F, plus a cost depending on the distance travelled, d miles.

For example, a formula for the delivery charge, £C, might be given by

$$C = ad + F$$

where a is a constant.

The graph shows the delivery charges, £C, for values of d from 0 to 60 miles for one particular courier.



The delivery charge for a courier service is sometimes more complex than this linear model.

END OF DATA SHEET

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