

THINKING SKILLS

9694/12

Paper 1 Problem Solving

October/November 2014

1 hour 30 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

* 5 9 2 6 1 9 1 6 9 9 *

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

There are **30** questions on this paper. Answer **all** the questions.

For each question there are four possible answers **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in pencil on the separate answer sheet.

Read very carefully the instructions on the answer sheet. Ignore responses numbered 31 – 40 on the answer sheet.

DO NOT WRITE IN ANY BARCODES.

INFORMATION FOR CANDIDATES

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

This document consists of **17** printed pages and **3** blank pages.

- 1 Toula has arranged to meet her friend outside Pesda railway station yesterday. As she arrived at the station the departures board was displaying the following:

<i>Departures</i>			
<i>Time</i>	<i>Destination</i>	<i>Status</i>	<i>Due in</i>
11:29	Fenik	On time	3 mins
11:37	Delnee	On time	11 mins
11:41	Hilsec	On time	15 mins
11:47	Rowtel	On time	21 mins
11:54	L espir	On time	28 mins
12:05	Fenik	On time	39 mins
12:11	Tamell	On time	45 mins
12:18	Delnee	On time	52 mins

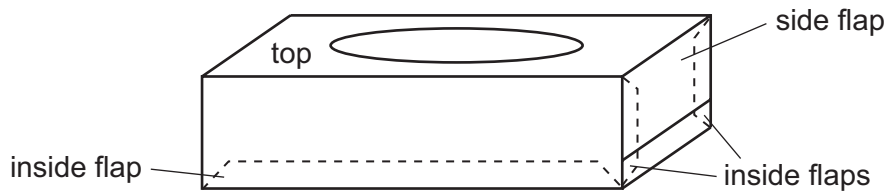
When her friend eventually turned up, this was the display on the departures board:

<i>Departures</i>			
<i>Time</i>	<i>Destination</i>	<i>Status</i>	<i>Due in</i>
12:05	Fenik	On time	8 mins
12:11	Tamell	On time	14 mins
12:18	Delnee	On time	21 mins
12:25	Washack	On time	28 mins
12:30	Hilsec	On time	33 mins
12:39	L espir	On time	42 mins
12:44	Fenik	On time	47 mins
12:52	Rowtel	On time	55 mins

How long did Toula have to wait for her friend outside Pesda railway station yesterday?

- A 29 minutes
- B 31 minutes
- C 37 minutes
- D 39 minutes

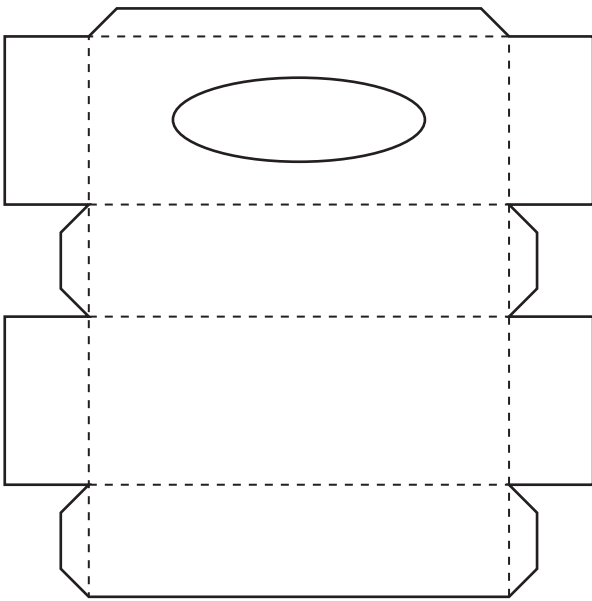
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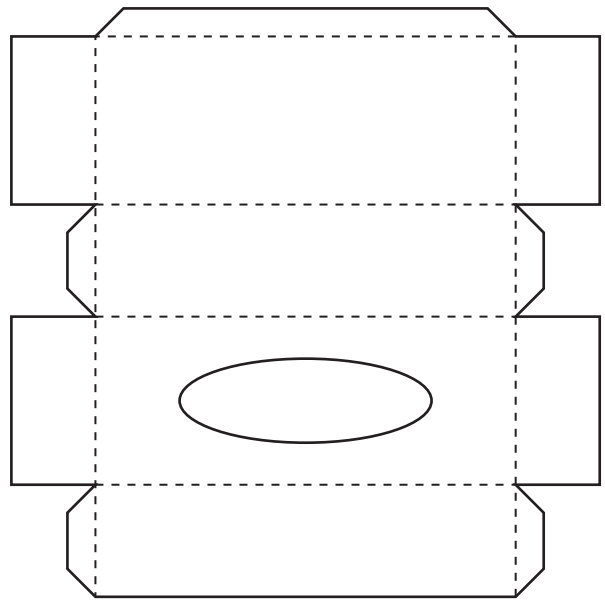
A cardboard container for tissue handkerchiefs as shown above is made up of one piece of cardboard cut and folded to the necessary shape and glued together. The two ends are overlapped and glued and the base is secured to the facing side on the diagram by a glued flap folded from the base. The top has an oval hole which allows the tissues to be withdrawn.

Which one of the four diagrams below represents the outline of the piece of cardboard?

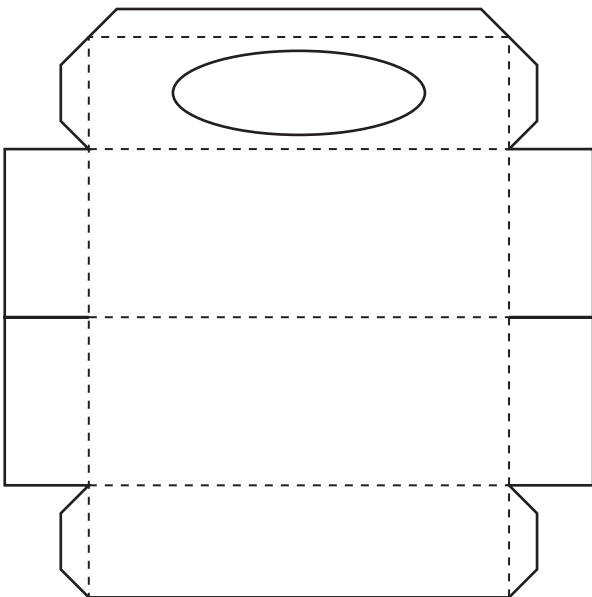
A



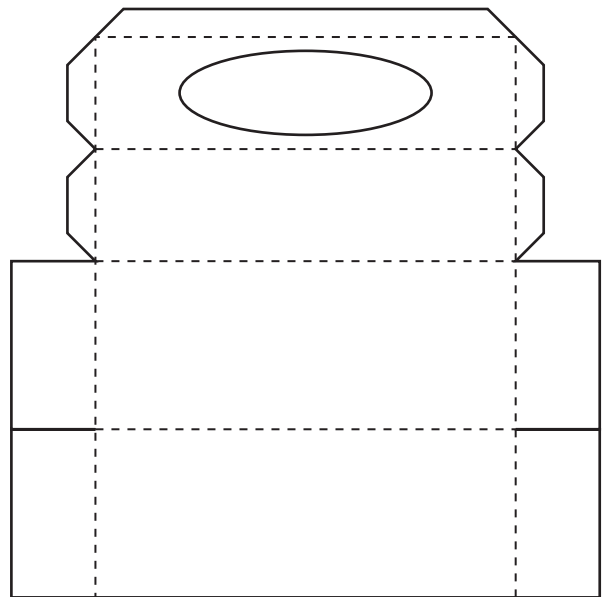
B



C



D



- 3 Delegates for a diplomatic summit must travel in taxis, each of which can take a maximum of 4, 5 or 6 people. When ordering taxis, it is not possible to specify the number of seats.

About 60 delegates are expected, but certainly no more than 80. It is essential that there is space for every delegate.

How many taxis should be ordered?

- A 10
 - B 14
 - C 15
 - D 20
- 4 Conducted tours of Carburgh Castle begin at the castle entrance every 20 minutes from 10:00 to 17:00 daily. Each tour takes 35 minutes to complete.

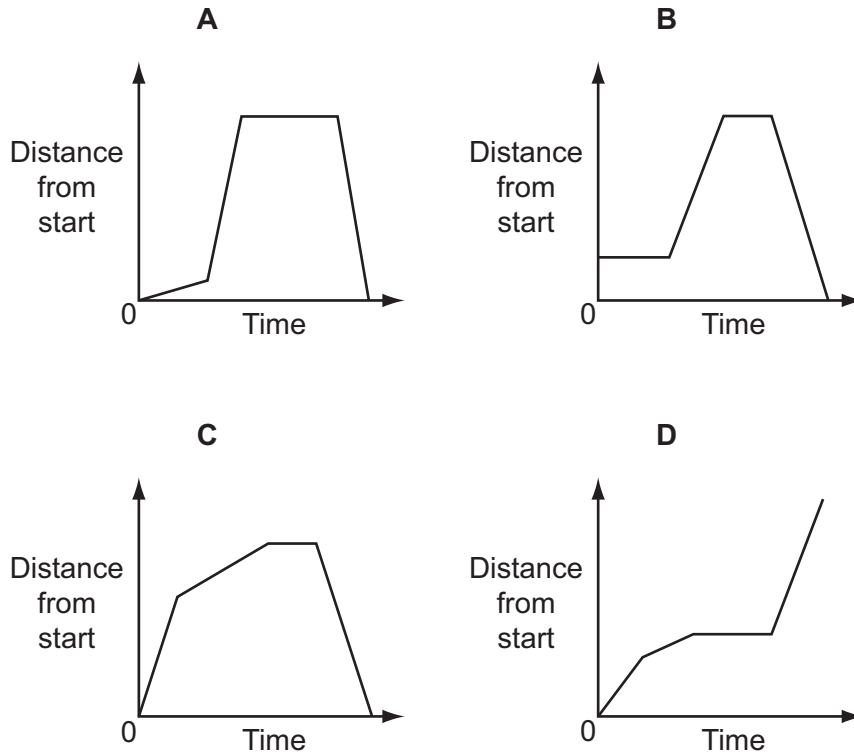
A number of guides are employed on a part-time basis to lead these tours. However, guides are expected to lead a minimum of six tours on any day that they do work.

What is the earliest time that a guide at Carburgh Castle can hope to finish work for the day?

- A 12:15
- B 13:20
- C 13:30
- D 13:55

- 5 A cyclist travels along a road at a constant speed. After a short time he reaches a hill. He ascends it slowly, stops at the top for a few minutes, and then turns around and cycles fast back down the hill.

Which of these graphs could represent this journey?



- 6 I have invited the Smith family and the Jones family to join me for dinner. There are 20 members of the Smith family and 15 members of the Jones family. I am the only other person who will be at the dinner. Unfortunately, the Smith and Jones families had an argument last night and so I do not want to have any member of the Smith family at the same table as a member of the Jones family.

I can set up tables for either 6 people or 8 people, but I want all of the tables to be for the same number. I want the number of empty spaces to be as small as possible.

How many empty spaces will there be?

- A 4
- B 5
- C 6
- D 7

- 7 Ken and Graham are old friends. At the beginning of the year they agreed to get together once a week. They alternate between a 5 mile walk followed by a pub lunch one week, and attending the local Jazz Club the next week. Graham's other commitments sometimes mean that a meeting is missed, and on these occasions the pattern of meetings is continued by putting the missed activity to the following week and resuming the pattern thereafter. In the first 14 weeks the sequence has been broken 3 times. During week 15, neither Ken nor Graham have other commitments, and the Jazz Club celebrates its 50th anniversary.

Which of the following further pieces of information, by itself, would be sufficient to determine whether they will be able to attend the 50th anniversary within the normal structure of their weekly meetings?

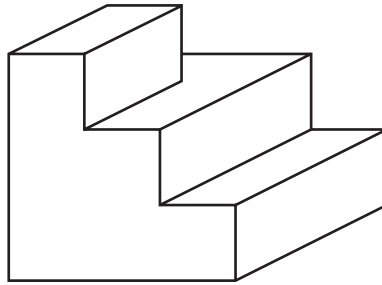
- A All the missing weeks were Jazz Club weeks.
 B Jazz Club is held on a Wednesday.
 C The meeting pattern started with Jazz Club on week 1.
 D Two of the missing weeks were Jazz Club weeks.
- 8 This table gives information about the four Great Lakes of Beckland.

	<i>Lake Brooklyn</i>	<i>Lake Cruz</i>	<i>Lake Harper</i>	<i>Lake Romeo</i>
<i>Surface Area (km²)</i>	15 286	80 785	12 833	24 794
<i>Volume of Water (km³)</i>	1481	7593	1373	2306
<i>Maximum Depth (m)</i>	193	206	178	167

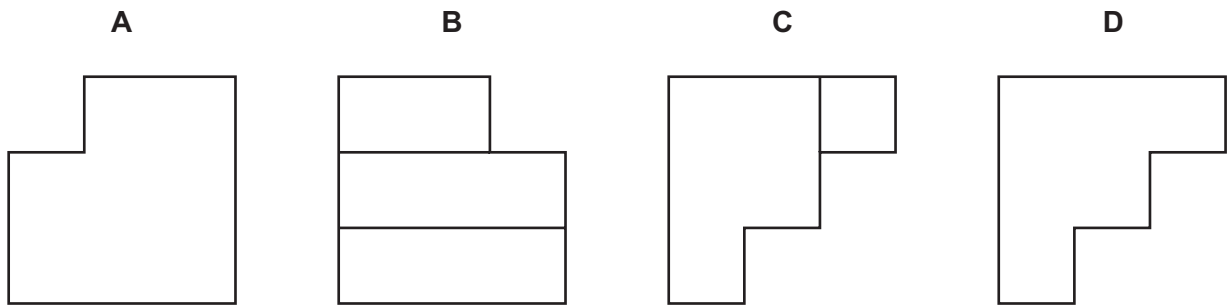
Which of the four lakes has the greatest average depth?

- A Lake Brooklyn
 B Lake Cruz
 C Lake Harper
 D Lake Romeo

- 9 This is a drawing of a 3-dimensional sculpture.



Which one of the following is **not** a view of the shape?



- 10 If a coach has been hired by an organisation for a fixed total fee, and it is only half full, the cost per person will be twice as much as it would have been if all the seats had been occupied.

Which one of the following could **never** be twice as much?

- A The number of apples that can be bought for a particular sum if they are on offer at half the normal price.
- B The number of lampposts that can be seen along a particular road if new ones are placed between the existing ones, halving the distance between successive pairs.
- C The number of people that can be served from a particular bottle of lemonade if glasses are filled halfway instead of to the top.
- D The number of slices of bread that can be spread with jam from a particular jar if only half as much jam as usual is used on each slice.

- 11 Harvey is a cyclist. His twin brother Torquil is a middle-distance runner.

Knowing that Harvey normally cycles at about 15 metres per second and Torquil runs at about 6 metres per second, they agreed to race over a distance of 3000 metres, with Torquil given 5 minutes head start.

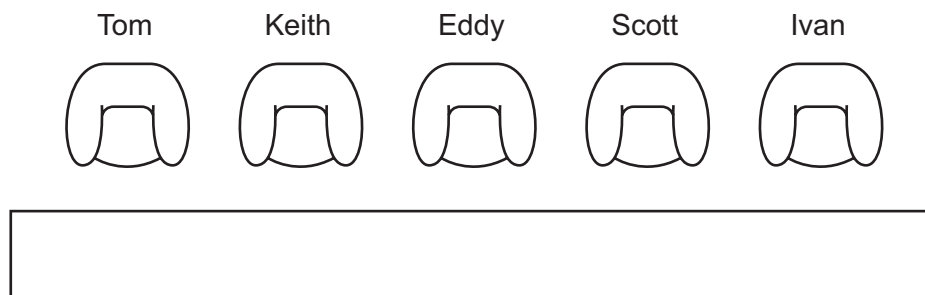
Torquil set off and maintained a steady speed of 6 metres per second until the final 300 metres which he covered in 38 seconds.

Harvey started exactly 5 minutes later, as agreed, cycling at 15 metres per second. However, after 480 metres he developed a puncture. With no possibility of repairing it, he carried on, but could only complete the rest of the course at 9 metres per second.

How long after Torquil did Harvey cross the finishing line?

- A 42 seconds
 B 74 seconds
 C 92 seconds
 D 124 seconds
- 12 Keith, Ivan, Tom, Eddy and Scott make up the band Kites. They have a superstition regarding press conferences. If they are required to hold two press conferences on the same day, then at the first one they don't worry about how they sit relative to each other, but at the later one they all have to sit in a different position and not be next to anyone they were next to at the earlier one.

This is how they sat at a press conference earlier today.



Their second press conference of the day is due to begin shortly. Ivan has already taken the middle seat.

Who will sit where Ivan sat at today's earlier press conference?

- A Eddy
 B Keith
 C Scott
 D Tom

13 The Bolandian currency consists of the following coins below \$1:



What is the most money you can have in coins and not be able to pay exactly \$1?

- A** \$0.99
B \$1.03
C \$1.19
D \$1.23
- 14 The local factory manager is planning to employ more staff. Each morning the manager looks at all of the applications that have been received since the previous morning. Once she has looked at all of the applications, the manager asks the administrator to contact them to let them know her decisions.

In the last three days the total times that the manager took to consider the applications were as shown in the table.

<i>Number of applications</i>	11	13	17
<i>Total time (minutes)</i>	60	75	95

The manager spends the same amount of time on each application and takes regular short breaks while working through the applications.

Which of the following could explain the way that the manager takes her breaks?

- A** She takes a 5 minute break after every third application.
B She takes a 5 minute break after every fourth application.
C She takes a 5 minute break after every fifth application.
D She takes a 5 minute break after every sixth application.
- 15 A chef has not got enough tomatoes to put a whole one on each of 120 salads, so she cuts them up. She does not need all the pieces to be exactly the same size. To make exactly 120 pieces, she makes 72 cuts, each cutting either a whole tomato or a piece of a tomato into two pieces.

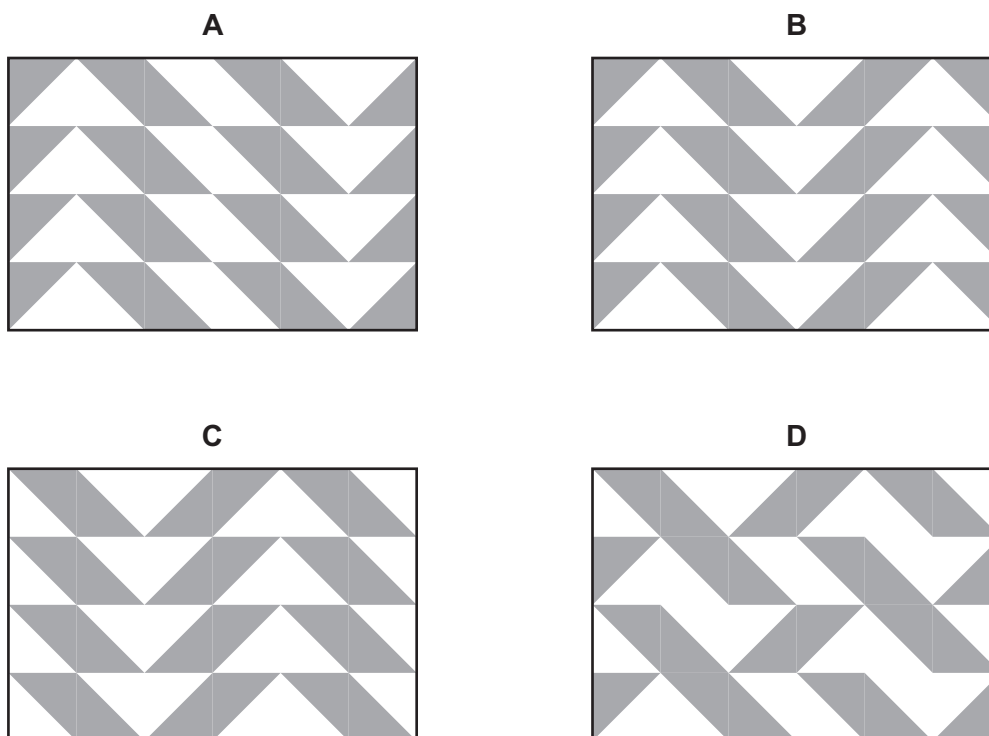
How many tomatoes did she start with?

- A** 36
B 48
C 60
D 72

- 16 I am designing a pattern that I will use to tile a rectangle which measures 1.5 m by 1 m. All of the tiles are rectangular and measure 75 cm by 25 cm. Every tile has the same pattern. One tile is drawn below:



Which of the designs below can **not** be created with these tiles?



- 17 Jo is taking an exam paper which has 40 multiple-choice questions. Each question has 4 possible answers; each correct answer scores 1 mark and there is no penalty for an incorrect answer. She knows the answer to 16 questions, but has no idea about the rest, so she guesses them.

What percentage is Jo most likely to score, assuming that the 16 she knows are answered correctly?

- A 22%
- B 40%
- C 55%
- D 70%

- 18 Kara went out to buy fruit for some of her workmates to have for lunch. She bought 7 apples and 11 bananas and paid a total of \$1.47, but she did not notice the individual prices for apples or bananas.

Tim wants 2 apples and a banana.

How much should he pay?

- A 24¢
 - B 25¢
 - C 27¢
 - D 29¢
- 19 A particular lady likes to walk taking two steps forward and then one back. She takes one second to walk two steps forward and two seconds to step back. Her forward and backward steps are both 60 cm in length.

How long does it take her to move 30 m from her starting position?

- A 50 seconds
 - B 88 seconds
 - C 145 seconds
 - D 150 seconds
- 20 In the interests of research, 1000 cats were each offered 4 identical dishes, each one containing a different cat food. The cat foods offered were *Punki*, *Obkat*, *Offaly* and *Rapidgro*. Of those cats who showed a single preference, 95% preferred *Punki*, 3% preferred *Offaly*, 1% preferred *Obkat* and 1% preferred *Rapidgro*.

The published research figures showed that, out of the 1000 cats tested, only 2 preferred *Obkat*.

Which one of the following statements is **not** correct?

- A Out of the 1000 cats tested, 80% showed no preference for a particular cat food.
- B Out of the 1000 cats tested, 6 showed a preference for *Offaly*.
- C Out of the 1000 cats tested, at least 3 cats showed a preference for either *Obkat* or *Rapidgro*.
- D Out of the 1000 cats tested, 950 preferred *Punki* to the other cat foods.

- 21 Gill leaves work each day in time to catch the 5pm train home to Gammaton station. Trains always take 30 minutes to reach Gammaton. Gill's husband Jim leaves home each day, drives to Gammaton station and collects Gill at 5.30pm. Yesterday, Gill was going out in the evening and she decided to catch the 4.30pm train home. She was not able to tell Jim of her decision so he left home to collect her at the usual time of 5.30pm. Arriving at Gammaton after the 30-minute journey, Gill started to walk home. Jim saw her walking and drove her the rest of the way home. They arrived home 10 minutes earlier than usual.

Assuming that the trains always run on time, that Jim drives at a constant speed and that no time is lost as Jim collects Gill, at what time did Gill get into the car yesterday?

- A 5.10 pm
 B 5.20 pm
 C 5.25 pm
 D 5.35 pm
- 22 Five teams were entered in the Oaklea Social Club quiz night. Teams answered questions on 5 subjects. For each subject, the first-placed team scored 5 points, down to 1 point for the fifth-placed team. Any team failing to answer over half the questions in a round (x) scored no points for that round.

At the end of the evening, each team's worst subject was ignored and the sum of the points for the best four subjects was calculated. Teams were ranked in order of points scored.

The table below shows the **finishing positions** in the five subject rounds.

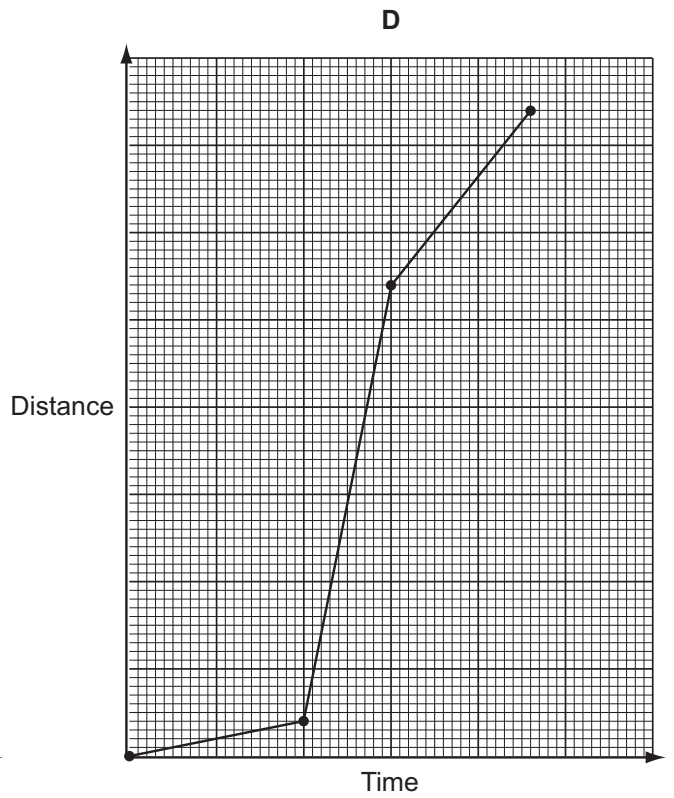
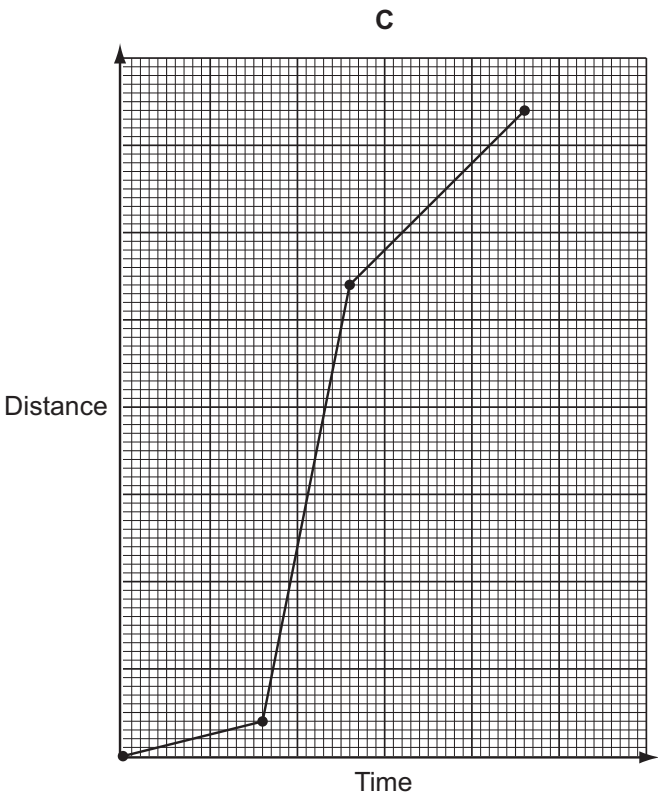
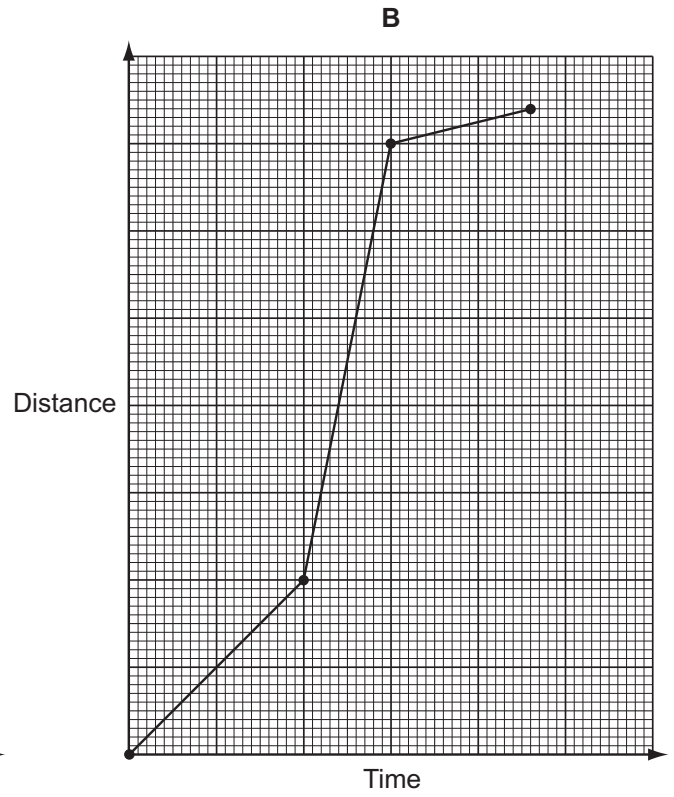
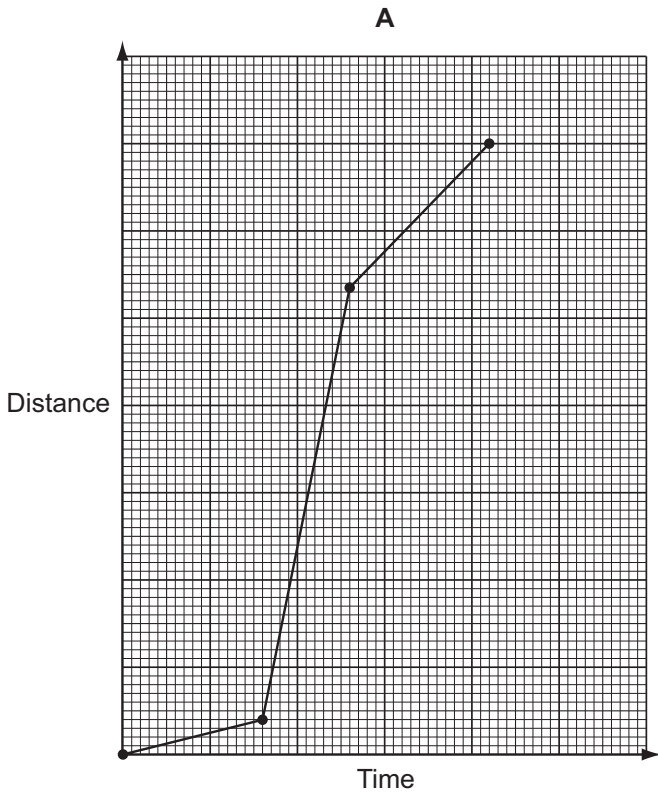
	<i>Practics</i>	<i>Questors</i>	<i>Riddlers</i>	<i>Savants</i>	<i>Thinkers</i>
<i>Science</i>	1	5	3	2	4
<i>Entertainment</i>	4	3	2	1	5
<i>Literature</i>	2	5	4	3	1
<i>History</i>	3	2	x	1	4
<i>Geography</i>	4	1	3	x	2

Who came **last**?

- A Questors
 B Riddlers
 C Savants
 D Thinkers

23 Peter takes part in a triathlon. He swims for 400 m at 1 km/h, then cycles for 5 km at 20 km/h and finally runs for 2 km at 4 km/h.

Which of the following graphs illustrates his journey?



24 Jacques left Sachin's house yesterday, walking homewards at 6 kilometres per hour. After 19 minutes, he realised that he had left his mobile phone behind. Immediately, he turned round to walk back, stepping up his pace to 9 kilometres per hour, unaware that Sachin had already been running at 15 kilometres per hour for 2 minutes, trying to catch him up. They continued at 9 kilometres per hour and 15 kilometres per hour respectively until they encountered each other.

How far from Sachin's house did they encounter each other?

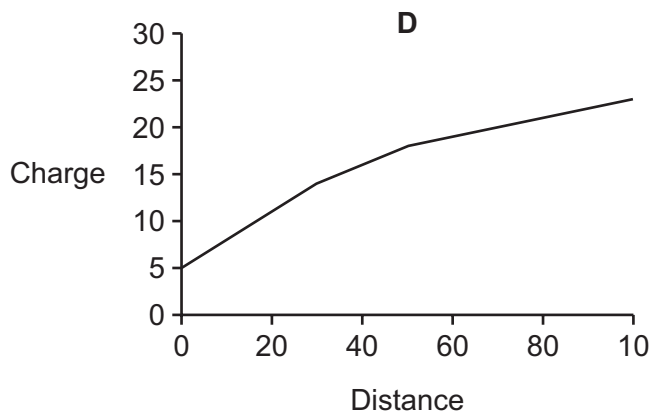
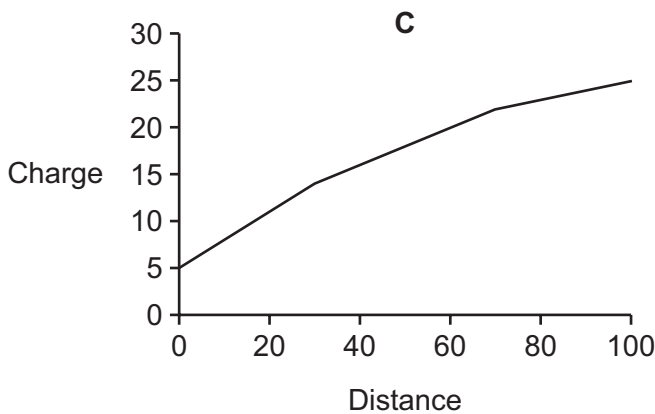
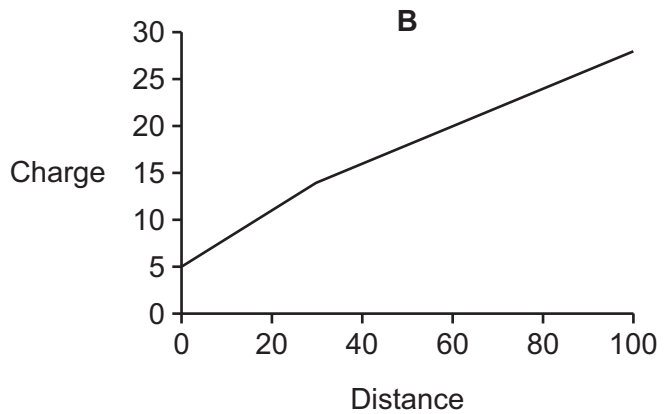
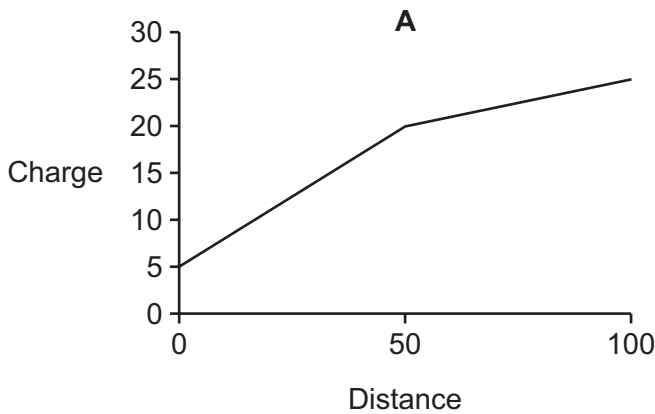
- A 1025 metres
- B 1200 metres
- C 1375 metres
- D 1500 metres

25 There are two different companies that I can use to deliver a parcel for me.

ParcelStar charge \$8 for any delivery, plus a further 20¢ for every kilometre.
 SuperPost charge \$5 for any delivery, plus a further 30¢ per kilometre for the first 50 km. Any extra distance above 50 km is charged at 10¢ per kilometre.

For any parcel that I choose to send I will choose the cheaper service.

Which of the following graphs represents the amount I will pay for deliveries over different distances?



26 A tutor tells her class, "Unless you attend the Revision Day, you will fail the exam".

Which of the following items of information, if true, would be sufficient to determine whether the tutor's prediction was right or wrong?

- A Everyone who attended passed.
- B Some who failed did not attend.
- C No one who failed did not attend.
- D Someone who passed did not attend.

27 A man who is lost finds an unmanned railway station, where the trains only stop when a passenger wants to get on or off, but unfortunately the signs have been removed for repair. There is however a train timetable and he has a watch to tell the time. It is 12:20 when he arrives at the station.

Wilneham → Alford

WILNEHAM	12:00	12:20	12:30	13:00
TAMFIELD	12:10	12:30	12:40	13:05
LICHWORTH	12:15	12:35	12:50	13:10
HINTSWAS	12:20	12:40	12:55	13:25
FAZEWICH	12:30	12:50	13:08	13:20
AMINGCOTE	12:35	12:55	13:15	13:30
ALREFORD	12:40	13:00	13:20	13:37

Alford → Wilneham

ALREFORD	12:10	12:30	12:45	13:04
AMINGCOTE	12:20	12:39	12:52	13:09
FAZEWICH	12:30	12:44	12:59	13:14
HINTSWAS	12:35	12:49	13:03	13:20
LICHWORTH	12:40	12:54	13:08	13:30
TAMFIELD	12:50	13:04	13:18	13:35
WILNEHAM	13:00	13:16	13:29	13:48

He looks at the timetable while he watches the trains go by for 50 minutes. Using his watch, he notices that three pass him going one way, at 14-minute intervals, and three pass him going the other way, firstly 15 then 20 minutes apart. None of the trains stops. However, he now knows where he is.

At which station is he?

- A Amingcote
- B Fazewich
- C Hintswas
- D Lichworth

- 28 Fatima arrives at the airport on the island of Small. She has to visit the towns of Killarn, Dunbil, Corktown and Baffle before returning to the airport. The kilometre chart below shows the distances between the places she must visit. Fatima wishes to visit the towns in the order that makes the total distance she travels on the island as small as possible, but on her route she must visit Baffle immediately after she has visited Corktown.

				Baffle
			Corktown	10
		Dunbil	25	35
	Killarn	30	9	19
Airport	14	22	13	23

Which one of the following pieces of advice should Fatima follow in order to keep the route travelled as short as possible?

- A Baffle should be the second town she visits.
 B Corktown should be the second town she visits.
 C Dunbil should be the second town she visits.
 D Killarn should be the second town she visits.
- 29 A taxi company charges a fixed hire fee (which is a whole number of dollars) plus a rate for each kilometre (which is a multiple of 10¢ and more than the set national minimum rate of \$1.75), rounded up to the nearest kilometre.

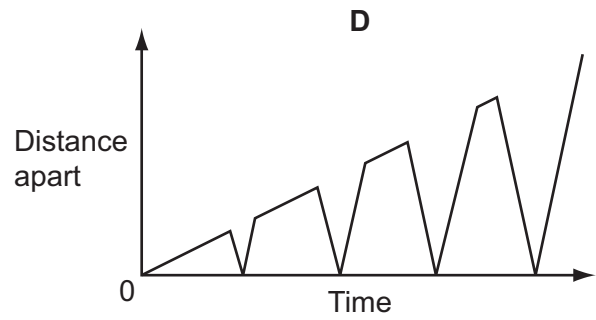
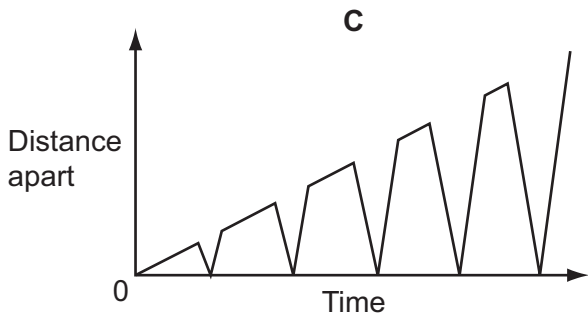
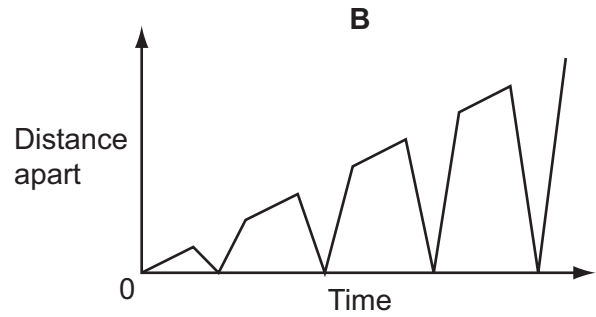
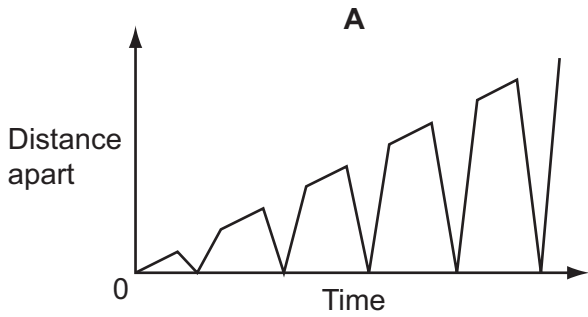
Maira's last journey cost \$37.90, but she does not know how far it was, or what the fixed hire fee is. She wants to know how far the journey was. She has a previous bill from the same taxi company, for a different journey, for \$21.80.

How far was her last journey?

- A 6 km
 B 7 km
 C 13 km
 D 21 km

30 This morning, Rebecca and Joanne went swimming. They started off together at one end of the pool and swam 50-metre lengths for half an hour. They both swam at a constant speed, but Rebecca was 25% faster than Joanne.

Which one of the following graphs shows how their distance apart varied, from when they began to the first time they were (momentarily) at opposite ends of the pool?



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