

THINKING SKILLS

9694/12

Paper 1 Problem Solving

May/June 2014

1 hour 30 minutes

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

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.

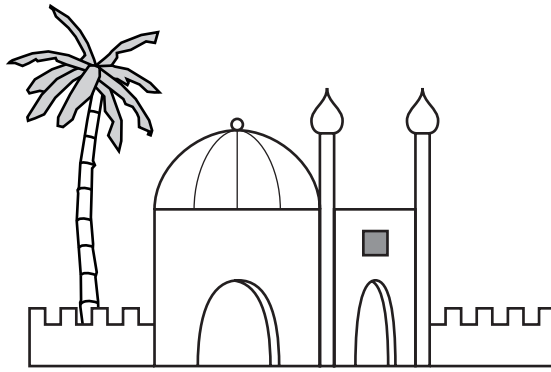
INFORMATION FOR CANDIDATES

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

This document consists of **16** printed pages.

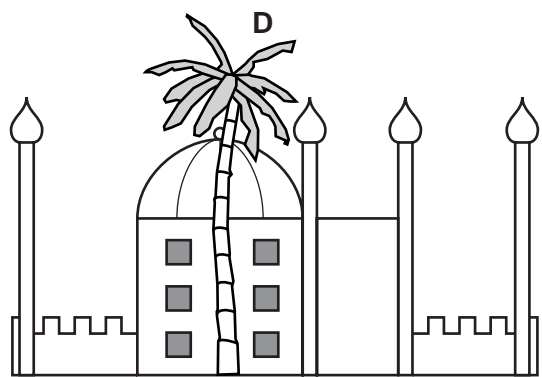
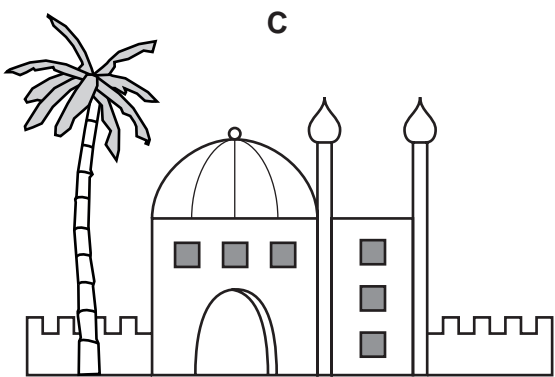
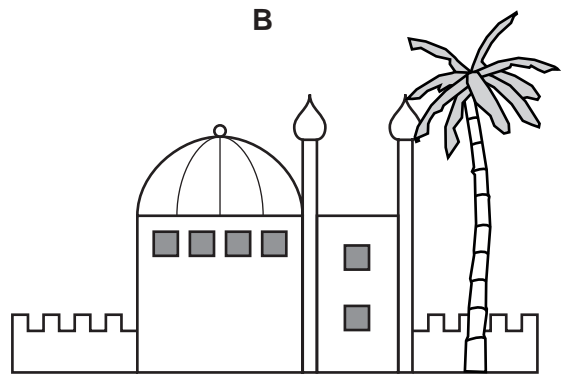
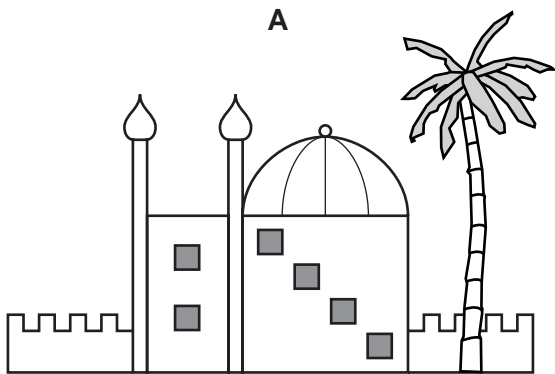


- 1 This is a sketch of the northern façade of a religious building in Istanbul.



This building has 4 minarets (the tall towers), of which you can see only 2 in the drawing and the other 2 are hidden. It has 6 windows on the southern façade, but no door.

Which of these is a possible view of the southern façade of this building?



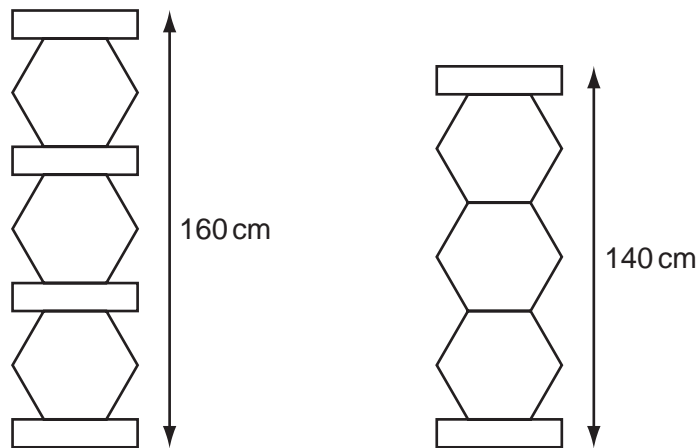
- 2 The table below shows the prices for travel by train between Gardentown and Workton.

Day return journey travelling Monday to Friday.	\$4.00
Day return journey travelling Saturday or Sunday.	\$3.00
5 day rover ticket. Travel as many times as you like any specific Monday to Friday.	\$17.50
7 day rover ticket. Travel as many times as you like on seven consecutive days.	\$21.50

Charlie commutes from Gardentown to Workton for work. He makes the journey every day Monday to Friday, and also has to go to work every third Saturday. He never goes to Workton on Sundays, and nor does he ever go apart from going to work.

If Charlie buys the tickets that keep his travel costs as low as possible, how much will this cost him for a three-week period?

- A \$52.50
 B \$55.50
 C \$56.50
 D \$58.00
- 3 A toy for children comprises two different kinds of blocks that can be placed on top of each other, a hexagon and a rectangle shape.



What is the height of the hexagon shape?

- A 10 cm
 B 25 cm
 C 28 cm
 D 40 cm

- 4 Jean lives in Annfield and wants to go by bus to Elton to arrive before 16:00 to meet her friend. On the way she wants to stop in Chester for at least 40 minutes to do some shopping.

Bus Timetable					
ANNFIELD	13:08	13:17	14:10	14:32	14:42
BOWES	13:40	13:50	14:30	15:02	15:18
CHESTER	14:13	14:28	14:58	15:23	15:50
DURHAM	14:28	14:50	15:16	15:38	16:06
ELTON	14:50	15:12	15:38	15:56	16:20

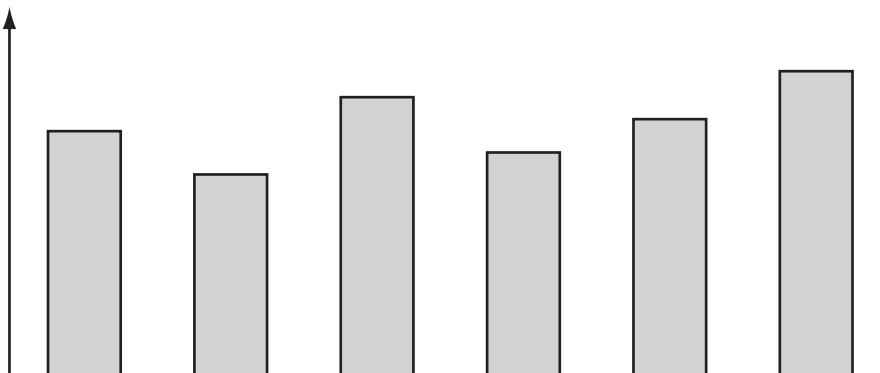
Which is the latest bus she can catch that will let her do her shopping and meet her friend on time?

- A 13:08
 B 13:17
 C 14:10
 D 14:32
- 5 At the end of every month, the sales manager of The Wheel Deal produces a bar chart to show car sales for the last six months.

The number of cars sold last year, month by month were as follows.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
188	223	165	217	173	139	194	155	180	212	161	206

This is one of last year's bar charts, but it has not been labelled.



Which six-month period does the bar chart represent?

- A February to July
 B April to September
 C May to October
 D July to December

- 6 A group of tourists is planning to visit Jupurnia and has a number of destinations that are to be visited during their 4-day trip. The four places to visit are Skoll, Orthosie, Themisto and Fenrir. They fly into Themisto on the 1st day, and will visit all other destinations before they fly out on the 4th day from Themisto. The table below gives the distance between towns in Jupurnia.

Adrastea																						
131	Bestla																					
75	76	Carpo																				
50	74	37	Fenrir																			
72	184	138	107	Greip																		
43	141	82	78	65	Metis																	
40	140	88	76	71	18	Narvi																
158	124	93	120	54	51	18	Orthosie															
58	158	124	93	12	54	51	18	Pasithee														
51	80	43	10	108	79	77	115	94	Skoll													
37	133	77	64	60	6	12	69	48	73	Tarvos												
24	123	86	60	54	31	23	61	40	61	26	Themisto											

Which itinerary will involve the least distance travelled over the 4 days in Jupurnia?

- A** Themisto to Orthosie to Fenrir to Skoll to Themisto
B Themisto to Skoll to Fenrir to Orthosie to Themisto
C Themisto to Fenrir to Skoll to Orthosie to Themisto
D Themisto to Fenrir to Orthosie to Skoll to Themisto
- 7 We have always applied the strict rule that the number of guests coming to a birthday party should be equal to the age of the child: seven for a seven-year-old, etc. Each guest brings a present to each party. Our children are now 3, 6, and 7.

How many presents have been received in all?

- A** 28
B 39
C 55
D 84

- 8 Three friends all have the same contract for their mobile phones.

In one particular month, Pat made 42 minutes of calls and was charged \$17.75, whilst Ella's 33 minutes cost \$15.95 and Neil had to pay \$20.15 for the 54 minutes that he spent on the phone.

Which of the following formulae does the company use to charge its customers?

- A \$6.05 per month + \$0.30 per minute
 B \$6.65 per month + \$0.25 per minute
 C \$9.35 per month + \$0.20 per minute
 D \$11.45 per month + \$0.15 per minute
- 9 Ludwig passed me some messages in code. When he saw that I could not work out the messages, he 'translated' them for me. Here are the three messages in code, each with its 'translation' written next to it.

- i) 3A2BC 2D3E4 FF4G6 HJ = Exams are difficult
 ii) 4F4KE JM4C3 A2BM2 DE = I find this exam hard
 iii) BNFD4 3KEC2 NC4J4 C32CN = My friend says it is easy

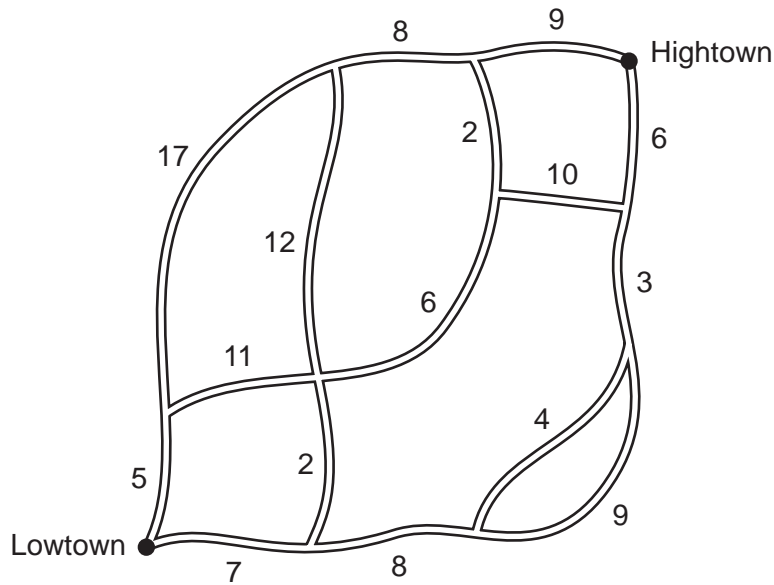
He passed me another message in the same code and gave me 4 possible 'translations', only one of which could be correct. Here is the message:

P3E5K 5JH4Q 33A2B CB6GM

Which one of these 'translations' must be the correct one?

- A He is not a very smart boy.
 B He is not the nicest chap.
 C We do not like exams much.
 D We do not love exams then.

- 10 John has to travel from Lowtown to Hightown as quickly as possible to attend a meeting. The diagram shows the time it takes in minutes to travel between each road junction.



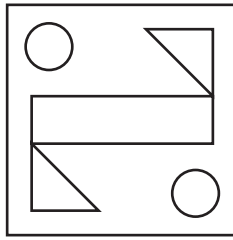
What is the shortest time it could take John to make this journey?

- A 25 minutes
 B 26 minutes
 C 28 minutes
 D 31 minutes
- 11 A lorry owner has his own fuel supply and needs to refill his storage tank. He has just completely filled the fuel tank of the lorry with 170 litres from empty. He now has 100 litres of fuel left in his storage tank. With the price of fuel expected to fall soon he only wants to buy enough for the next fortnight. Normally his regular short daily trips total 300km and this leaves just 20 litres in the lorry's fuel tank. He expects to complete three regular days of 300 km journeys each week, but this could rise to five. Sometimes the total journeys are longer but his daily trips never total more than 400 km in a day. He never works more than five days in a week. His storage container holds 4000 litres.

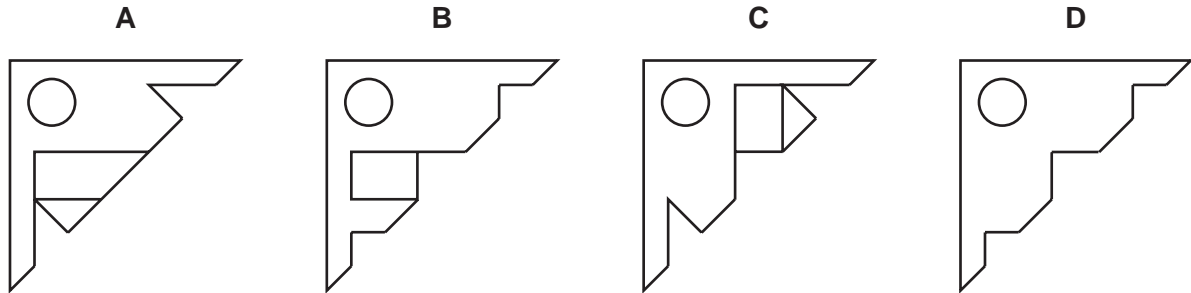
How much fuel should he order to be certain that he has enough for the next two weeks?

- A 630 litres
 B 1730 litres
 C 1900 litres
 D 2000 litres

- 12 The square piece of paper shown below has five holes cut into it. It is folded so that the two circles overlap.



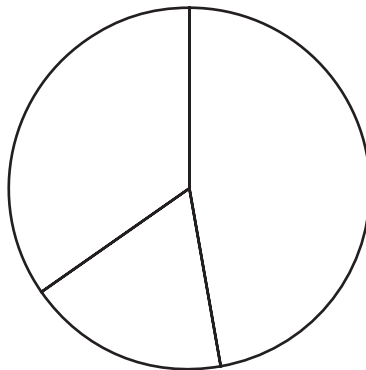
Which diagram shows what the resulting paper could look like?



- 13 The result of the voting for the Bolandia College student representative was as follows:

Armin Rees	43
Keela Sandquist	28
Jenny Trent	14
Matteus Umbert	38

The school secretary entered the data into her computer. Unfortunately, she failed to enter the result for one of the candidates, and this pie chart appeared on her screen:



Which candidate had she not entered?

- A Armin Rees
- B Keela Sandquist
- C Jenny Trent
- D Matteus Umbert

- 14** At the Bolandia zoo, four different animals must be temporarily placed in two separate enclosures. Animals must not be placed in the same enclosure if one of them will prey on another.

Girbras prey on antelions but not on rhinolopes.

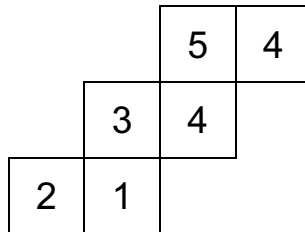
Antelions will prey on tigaffes, but only if there are no rhinolopes present.

Rhinolopes prey on girbras but not on antelions or tigaffes.

Tigaffes prey on girbras but not on antelions.

Which animal must be placed on its own (in an enclosure with no other animals)?

- A** The antelion
 - B** The girbra
 - C** The rhinolope
 - D** The tigaffe
- 15** The net below is folded up to make a cube.



What is the largest total of two numbers on opposite faces of the cube?

- A** 5
 - B** 6
 - C** 7
 - D** 8
- 16** 27 people came into the sports centre this morning. 17 used the gym and 14 used the swimming pool.

What is the largest number that could have used neither the gym nor the swimming pool?

- A** 3
- B** 4
- C** 10
- D** 13

- 17 The letters of the word "ASTER" can be arranged in 120 different ways. If these are arranged in alphabetical order (starting with AERST), where does the word RATES come?
- A 5th
B 29th
C 53rd
D 65th
- 18 Four teams competed in a balloon race of 150 kilometres. The teams flew at varying speeds by catching the wind at different altitudes. The data below shows how long each team spent flying at different speeds, starting from the beginning of the race.

<i>Team</i>	<i>Speed (km/h)</i>	<i>Time (hours)</i>	<i>Speed (km/h)</i>	<i>Time (hours)</i>	<i>Speed (km/h)</i>	<i>Time (hours)</i>
Arrow	30	1	35	3	20	2
Flame	35	3	40	1	5	2
Hurricane	10	3	40	2	80	1
Velocity	20	2	30	3	20	1

Which team was the first to travel 150 kilometres?

- A Arrow
B Flame
C Hurricane
D Velocity
- 19 When I want to use my computer,
- loading my email program takes 1 minute;
 - loading my word-processing software takes 2 minutes;
 - loading my music program takes 3 minutes;
 - initialising the virus protection takes 3 minutes;
 - checking the hard disk takes 4 minutes.

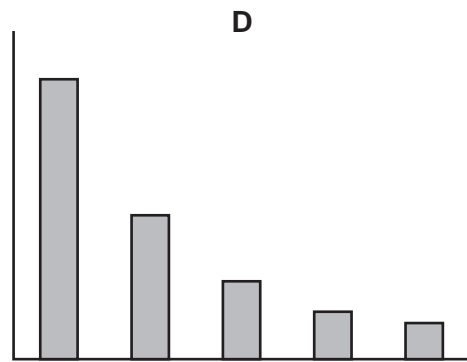
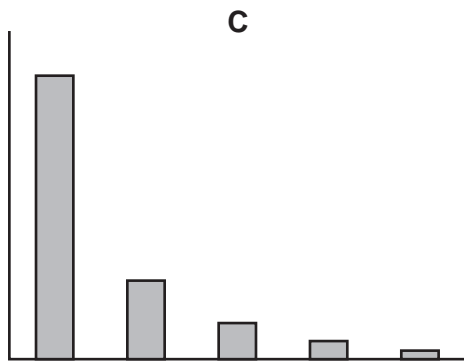
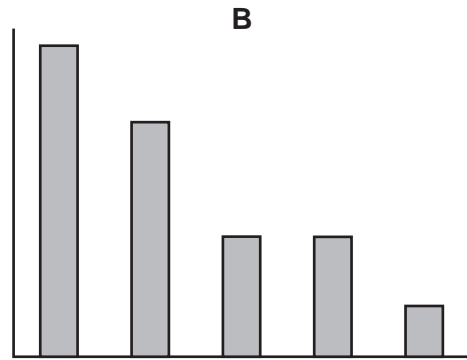
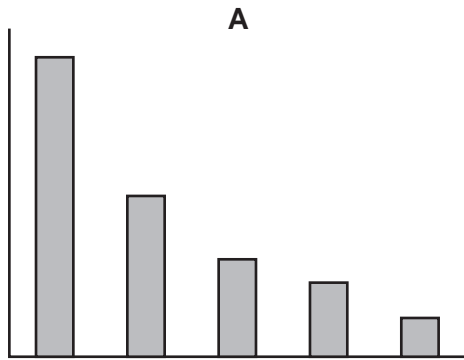
My computer can do up to three things at a time, but once it has begun doing something it carries on until it has finished it.

What is the shortest possible time before all of these tasks are completed?

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

20 Wooden toy blocks for children are made in the shape of cubes and come in five sizes: 10, 15, 20, 25 and 30 millimetres in side length. The blocks are packed into boxes, each also a cube with side length 200 millimetres. Only one size of block is ever packed into one box.

Which graph below best represents the number of each size of block that will fit into a box?



21 Security arrangements can contribute a considerable amount to the price of a flight ticket. The price of a ticket is composed of:

- a fee for the departure checks;
- a fee for arrivals procedures;
- an amount related to the length of the flight.

The fees vary significantly from airport to airport.

Some single fare prices, including fees are shown below.

		<i>Arriving at</i>		
		Charleston	Kingston	Jamestown
<i>Departing from</i>	Charleston	–	\$80	\$111
	Kingston	\$74	–	\$97
	Jamestown	\$85	please enquire	–

The three cities are arranged in a triangle, and the prices would all be the same if it were not for the fees.

What would be the cost of a flight from Jamestown to Kingston?

- A \$55
- B \$77
- C \$97
- D \$116

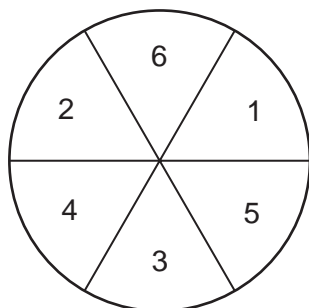
22 Amy's mother sent her to the post office to buy stamps for a letter. By the time she got there, she had forgotten how much the letter would be to post, but she was sure it was between 8¢ and 12¢ inclusive. The post office sells stamps in every single cent denomination from 3¢ to 10¢, and then the next is 15¢.

What is the least amount that Amy could spend on stamps and still be able to cover any postage value from 8¢ to 12¢?

- A 12¢
- B 15¢
- C 18¢
- D 21¢

- 23 A fairground uses a simplified dartboard as shown below.

I am not very good at darts, and if I aim at the centre of a number, I only stand a 40% chance of hitting that number and a 30% chance of hitting each of the two adjacent numbers.



At which number should I aim to get the highest average score if I throw a large number of times?

- A 1
 B 2
 C 3
 D 6
- 24 John is paid \$10 per hour, but a higher rate for any hours that he works after 6 pm. He always starts and finishes work exactly on the hour. In any week, John might be asked to work any of the hours between 1 pm and 9 pm on up to 5 of the days. He worked for 30 hours in each of the last two weeks, but was paid \$30 more for the first week than the second.

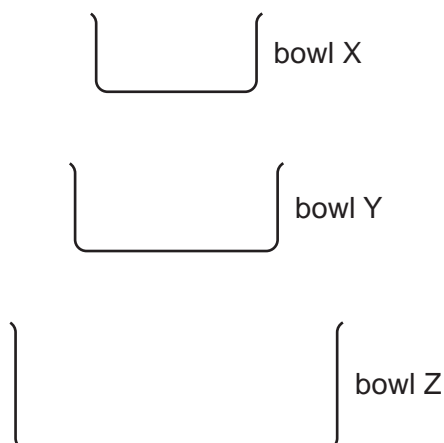
What is the lowest possible rate for hours after 6 pm that could explain this?

- A \$11.00
 B \$11.20
 C \$12.00
 D \$13.00
- 25 While I was driving from Bickton to Carford at 90 km/h, a bus passed me going the other way. 10 minutes later, another bus passed me. I know the buses from Carford to Bickton leave at 30-minute intervals.

At what average speed do the buses travel?

- A 30 km/h
 B 36 km/h
 C 45 km/h
 D 60 km/h

- 26 The diagram shows three bowls arranged vertically. Bowl X has a capacity of 100 ml, bowl Y has a capacity of 150 ml and bowl Z has a capacity of 750 ml.



Water is poured into bowl X. When X is full the water overflows into bowl Y, and when Y is full water overflows into bowl Z. All bowls are empty to begin with and then water is poured at a constant rate for twenty minutes into bowl X. The constant rate is then halved and water continues to pour into X for a further 20 minutes. A record is taken of how much water is in bowl Z every 10 minutes from the start of pouring.

Which one of the following records could be an accurate measure of the accumulation of water in bowl Z?

	After 10 minutes	After 20 minutes	After 30 minutes	After 40 minutes
A	0 ml	0 ml	0 ml	75 ml
B	0 ml	0 ml	50 ml	100 ml
C	0 ml	150 ml	250 ml	350 ml
D	50 ml	250 ml	400 ml	550 ml

- 27 My passcode for internet banking is a 6-digit number in which all 6 digits are different. It can be written as three 2-digit numbers in increasing numerical order that total 99 when added together. The first and second digits are 1 and 9 respectively.

Which one of the following additional pieces of information would be sufficient by itself to enable deduction of the whole of the passcode?

- A** The last digit of the passcode is 7.
- B** The third digit of the passcode is 2.
- C** The third of the 2-digit numbers is more than twice the second one.
- D** The three 2-digit numbers are all odd numbers.

28 Kevin sells chocolates in his shop. He sells the chocolates in boxes of one of three sizes:

A small box will hold 10 chocolates and costs \$4.

A medium box will hold 20 chocolates and costs \$7.

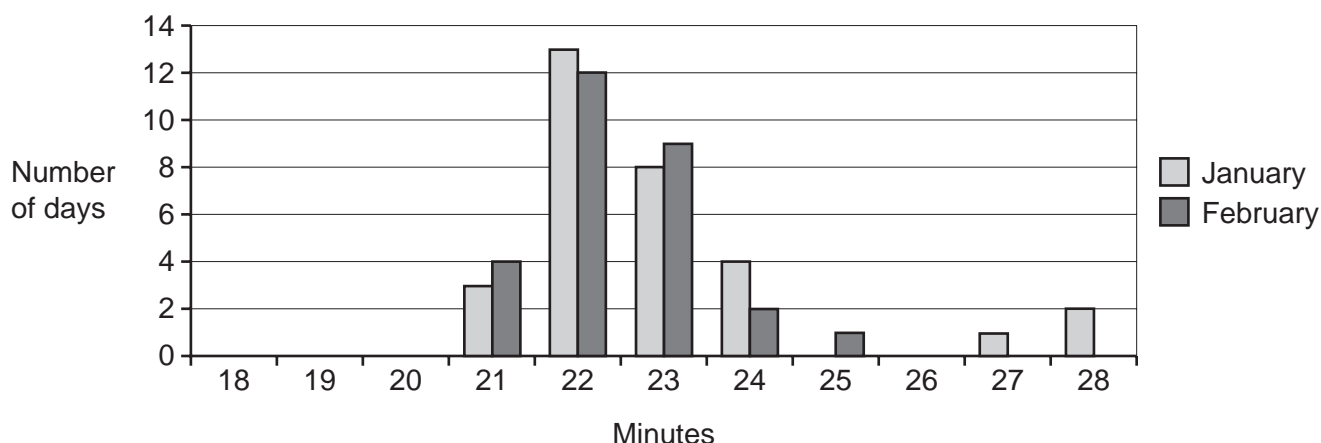
A large box will hold 50 chocolates and costs \$15.

Customers are allowed to choose any combination of the chocolates available when purchasing any size box of chocolates. When he closed the shop yesterday, Kevin had sold chocolates for a total of \$783. Exactly 100 boxes had been sold during the day.

What is the greatest number of large boxes that could have been sold yesterday?

- A 13
- B 34
- C 51
- D 63

29 The times taken by the daily train between Tinseltown and the next stop at Rideaux are shown below.



Which of the following, on its own, would lead to such a change in the distribution from January to February?

- A Some trains were slowed down by snow in January.
- B A new timetable with constant intervals between departures was introduced in February.
- C A more powerful engine came into service on February 1st.
- D There are more days in January than February.

- 30** Four of my friends just got back from the local café having had a long break to sit and talk. They each paid for their own food and drinks and they know that there were no special offers.

They can each remember the total cost of their purchases but not the individual costs for the items.

Bill had 1 cup of tea, 2 slices of cake and a cup of hot chocolate.

John had 2 cups of tea and 1 slice of cake.

Karen had 2 cups of tea, 1 slice of cake and a cup of hot chocolate.

Sue had 3 slices of cake and 2 cups of hot chocolate.

I want to work out the individual price of the items, and I have realised that I only need to know the totals of three of the orders as long as one particular order is included in the three.

Which one of the totals must be included in the three that I choose for me to be able to work out the individual prices?

- A** Bill's order
- B** John's order
- C** Karen's order
- D** Sue's order