THINKING SKILLS   **9694/13**

Paper 1 Problem Solving   **October/November 2015**

                                                  1 hour 45 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 **18** printed pages and **2** blank pages.

          [Turn over

1 I am planning to buy a new house and have been given four options to consider by the estate agent. My ideal house would have at least 3 bedrooms, a large kitchen and a garage. I also want to live within 5 km of my work. I will consider any houses that satisfy three of the four conditions. The details of the houses that I have been given are below.

Address	Size of kitchen	Number of bedrooms	Garage	Distance from work
22 Station Road	Small	5	Yes	4 km
6 Church Lane	Large	3	Yes	7 km
15 Main Street	Small	4	No	2 km
7 Park Avenue	Large	2	Yes	3 km

Which is the house that I will **not** consider?

A   22 Station Road

B   6 Church Lane

C   15 Main Street

D   7 Park Avenue

2 In Bolandia, the streets are constructed from 10-metre pieces. A lamppost must be placed at both ends of every completed street and at points every 10 metres along its length. Additional lampposts must also be placed at every notice board along the road.

Einstein Street, in Bolandia, has 7 notice boards, and 42 lampposts were needed altogether.

How long is Einstein Street?

A   330 metres

B   340 metres

C   350 metres

D   360 metres

3

Which of the following shapes, when rotated, would fit together with the shape given above to form a rectangle?

A

B

C

D

4 The bill for my shopping came to $20. I bought four items, all at different prices and all whole numbers of dollars, but all I can remember is that one cost $6 and three of the prices were consecutive numbers.

Which of the following was one of the prices?

A $1

B $2

C $3

D $4

5 In the year 1920, on the morning of his 71st birthday, Ben recorded in his diary that he had visited the graves of two friends.

Andy
1848-1919
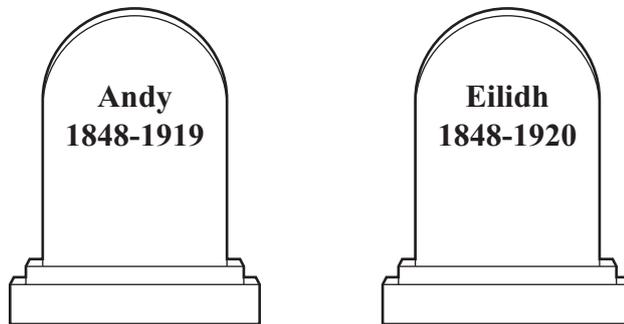
Eilidh
1848-1920

Which one of the following statements must be true?

A Andy lived longer than Eilidh

B Ben was born after both Andy and Eilidh

C Andy and Eilidh died within 12 months of each other

D Andy, Ben and Eilidh all died at the same age

6 The table below gives the shortest time in minutes that it takes to travel between different locations in a village.

	Supermarket	Coffee shop	Sarah's house	Library	Park
Jane's house	6	7	20	9	2
Park	8	7	23	14	
Library	5	6	14		
Sarah's house	18	17			
Coffee shop	12				

Jane wants to meet Sarah as soon as possible and they are both about to leave their houses.

At which location are Jane and Sarah able to meet soonest?

A Coffee Shop

B Library

C Park

D Supermarket

7 At a recent televised snooker match between James Hoopoo and Ron Knight, a viewer phone-in was held to vote on which player was the better tactician. Ron scored only 24%.

If this figure has been given to the nearest 1%, what is the smallest number of votes that could have been cast?

A 4

B 17

C 25

D 33

8 Volunteers are needed to prepare for a coffee morning. The kitchen is available for 3 hours and 20 large and 700 small cakes are needed. 1 volunteer can make either 2 large or 35 small cakes in each hour.

How many volunteers are required?

A   7

B   10

C   11

D   20

9 I am travelling on a train when another train passes on a parallel track. I note the time taken between the front and the rear of the other train passing my window.

Which one of these pieces of information is irrelevant when working out the speed of my train?

A   The length of my train

B   The length of the other train

C   The speed of the other train

D   Whether the passing train was going in the same or in the opposite direction to mine

10 Although they are unaware of each other, both Pat and Kim will soon be attempting to walk the full length of the Yanglow Trail, which stretches for 372 kilometres between Sidneth and Farden.

Pat will leave Sidneth on the 1st of next month, and intends to walk 25 kilometres each day. Kim is going to start from Farden 3 days later, and intends to walk 35 kilometres each day.

If they both walk their intended distances each day, on what day next month will Pat and Kim meet each other on the Yanglow Trail?

A   5th

B   8th

C   10th

D   11th

11 Mara is preparing for a half marathon. Her training schedule lasts 10 weeks up to the race and she has set the following target distance per week:

Week	1	2	3	4	5	6	7	8	9	10
Distance (km)	20	30	40	50	60	70	80	70	50	30

Which of the following graphs shows the average weekly distance she has done from the start of training to the end of the week shown?

A

B

C

D

9694/13/O/N/15   **[Turn over**
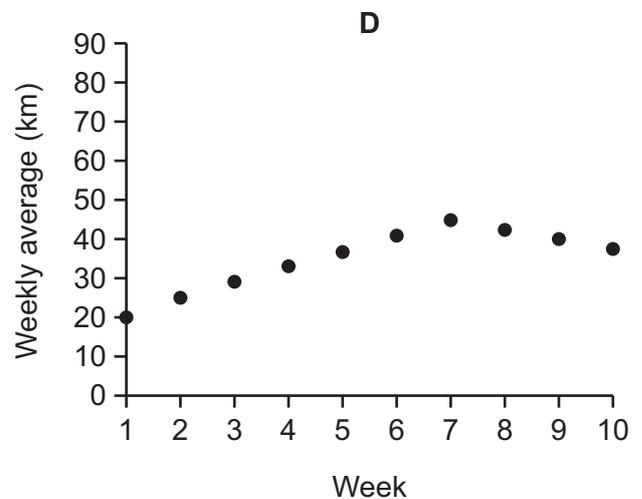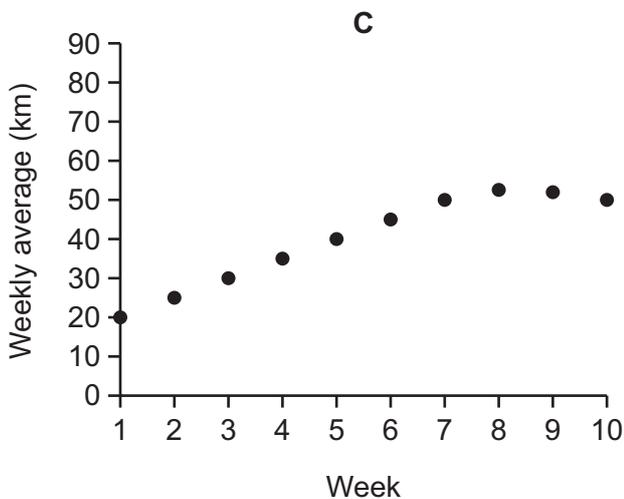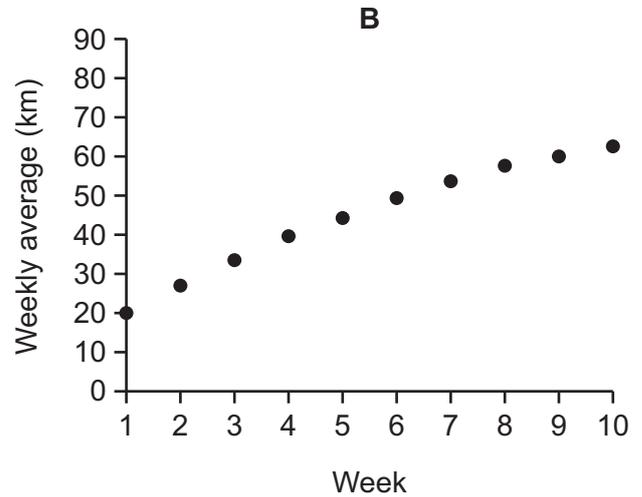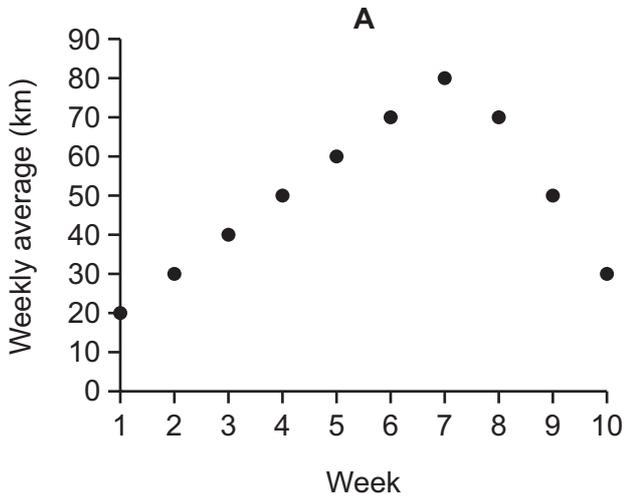
12 The table below shows Annabel's mobile phone costs for a year. Her contract gives her 50 free minutes and 250 free texts per month included in her monthly standing charge. At some point during the year, the phone company changed the tariff to charge more per minute, but reduced the monthly fee.

	Minutes	Texts	Cost ($)
Jan	75	120	25.00
Feb	80	140	26.00
Mar	60	160	22.00
Apr	95	150	29.00
May	100	180	30.00
Jun	95	160	29.00
Jul	90	150	28.00
Aug	80	120	24.00
Sep	65	110	19.50
Oct	90	140	27.00
Nov	105	120	31.50
Dec	130	100	39.00

In which month was the tariff changed?

A May

B August

C September

D November

13 A 24-hour digital clock of mine behaves very strangely. It displays the correct four digits at all times, but in descending numerical order.

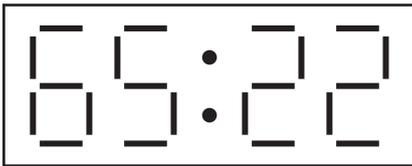For example, at 08:11 its appearance is
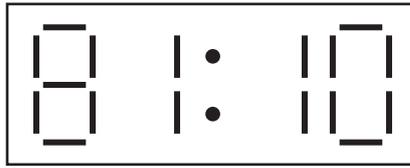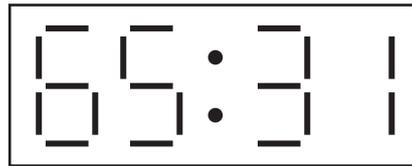

At present it is showing
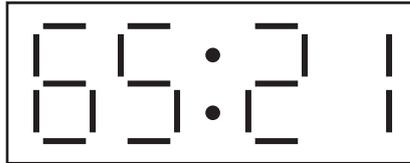
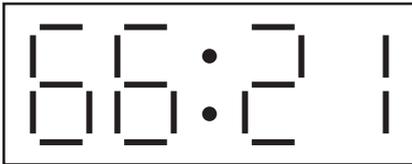Which of the following could **not** be the display one minute from now?
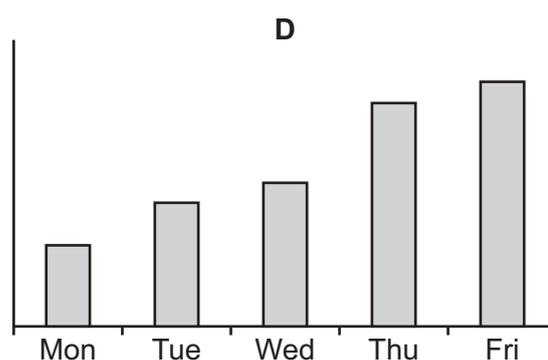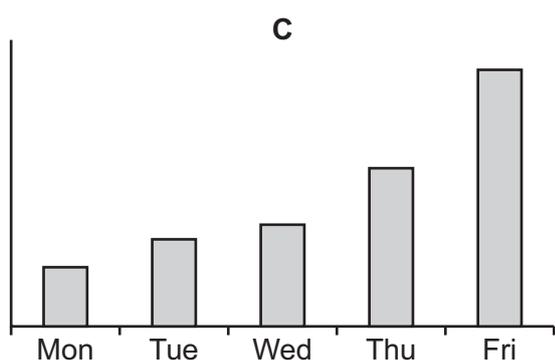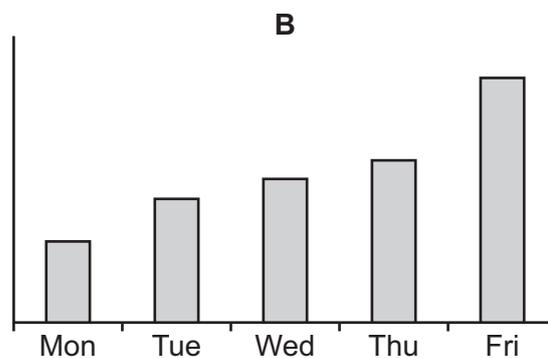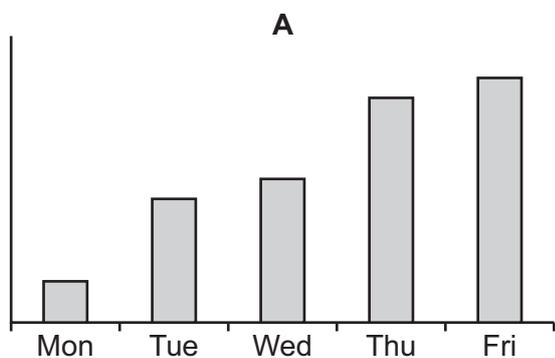
A	B

C	D
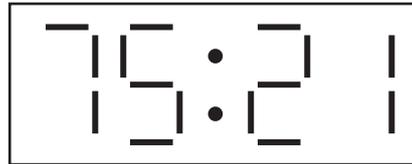
14 Last week students at a local school collected money for a charity. The collections started well and on Monday they had collected one third of the money that they needed to raise. Tuesday was not such a good day and they collected only half of the total that had been collected on Monday. On Wednesday one of the group was ill and so they could not collect as much money as they had on Tuesday. On Thursday they managed to match the collection from Monday. On Friday they collected the remaining money that was needed to reach their target in the morning and then they stopped making collections.

Which of the following bar charts shows the total amount of money raised at the end of each day?

A

| Mon | Tue | Wed | Thu | Fri |

B

| Mon | Tue | Wed | Thu | Fri |

C

| Mon | Tue | Wed | Thu | Fri |

D

| Mon | Tue | Wed | Thu | Fri |

15 I am going to tile my kitchen floor. I want to ensure that all the tiles are the same size and that there are no gaps. The floor is rectangular, measuring 4.5 m x 3.6 m.

There are four sizes of tile that I can choose from, as follows:

Tile size	Number in pack	Price per pack
30 cm x 30 cm	15	$35
40 cm x 25 cm	12	$30
40 cm x 30 cm	10	$28
40 cm x 40 cm	8	$25

Tiles can only be bought in full packs.

I want to keep the cost to a minimum, but I don't want to cut any tiles to fill in gaps.

Which size of tile should I buy?

A 30 cm x 30 cm

B 40 cm x 25 cm

C 40 cm x 30 cm

D 40 cm x 40 cm

16 Customs officers at Kontrabandia's main airport operate two checkpoints. At the first checkpoint they stop and search 1 out of every 4 passengers in the queue. At a second checkpoint they search 1 in 5 of all those *not* searched at the first checkpoint.

Of 400 passengers arriving, 5% are trying to smuggle goods.

How many of these are likely to get though without being searched?

A 8

B 9

C 11

D 12

17 A painter mixes 6 litres of red paint with 5 litres of blue paint, but then realises that she meant to do it the other way round.

How much blue paint must she now add to the mixture to produce the exact colour that she wanted?

A   1 litre

B   2 litres

C   2.2 litres

D   2.4 litres

18 Four friends, all 23 or 24 years old, wish to join a tennis club together. There are three equally good clubs very close to where three of the friends, Ann, Butch and Cassie, live. Don lives 40 kilometres away.

Butch is still in full time education taking a higher degree, while the other three have left their student days behind them and are pursuing their various careers.
Cassie is in the entertainment business and can play tennis in the daytime on weekdays only. Apart from Cassie, the friends all insist on being able to play on evenings and weekends as well as on weekdays.

Annual membership rates differ for the various categories of membership at each of the clubs. The prices of these are in the table below.

|	Victoria Tennis	Granville Tennis	Brooke Tennis
Adult	$170	$115	$90
Young person (18 to 24)	$85	$115	$85
Full-time student	$66	$70	$50
Child (under 18)	$41	$70	$30
Country member (residing more than 30 km away)	$66	$55	
Off-peak (playing 09:00 to 18:00 Mondays to Fridays)	$90	$70	
Sunday Club (Sunday afternoons only)	$56		

What is the least total amount that the four friends must pay to join the same club and play tennis when they want to?

A $302

B $305

C $307

D $310

**19** The diagram shows the net of a triangular pyramid.
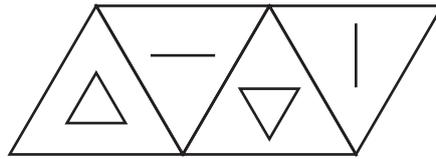
Which of the following could be a view of the triangular pyramid?

A	B	C	D
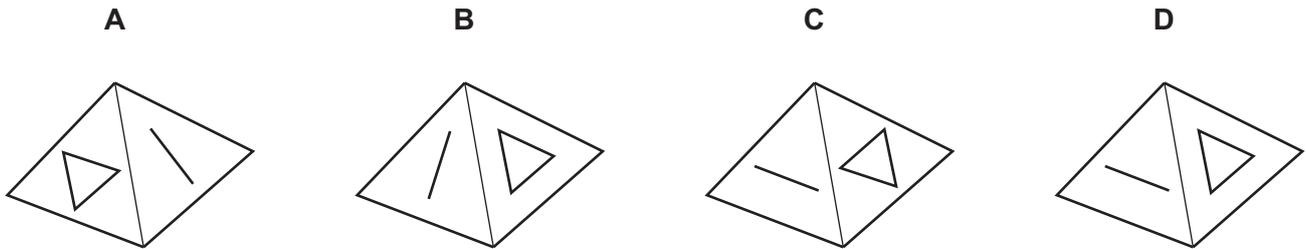
20 A container is in the form of a cylinder. On the base of the container there is a tap and initially the container is full of water. Jenny opens the tap and water begins to leave the container at a constant rate. When the cylinder is half full, Jenny begins to pour water in at the top of the container at a constant rate that is 0.75 times the rate at which water is leaving via the tap. When the cylinder is nearly empty, Jenny closes the tap, but continues to pour water in at the same constant rate as before, until the container is full again.

Which of the following graphs best represents the height of the water in the container over time?
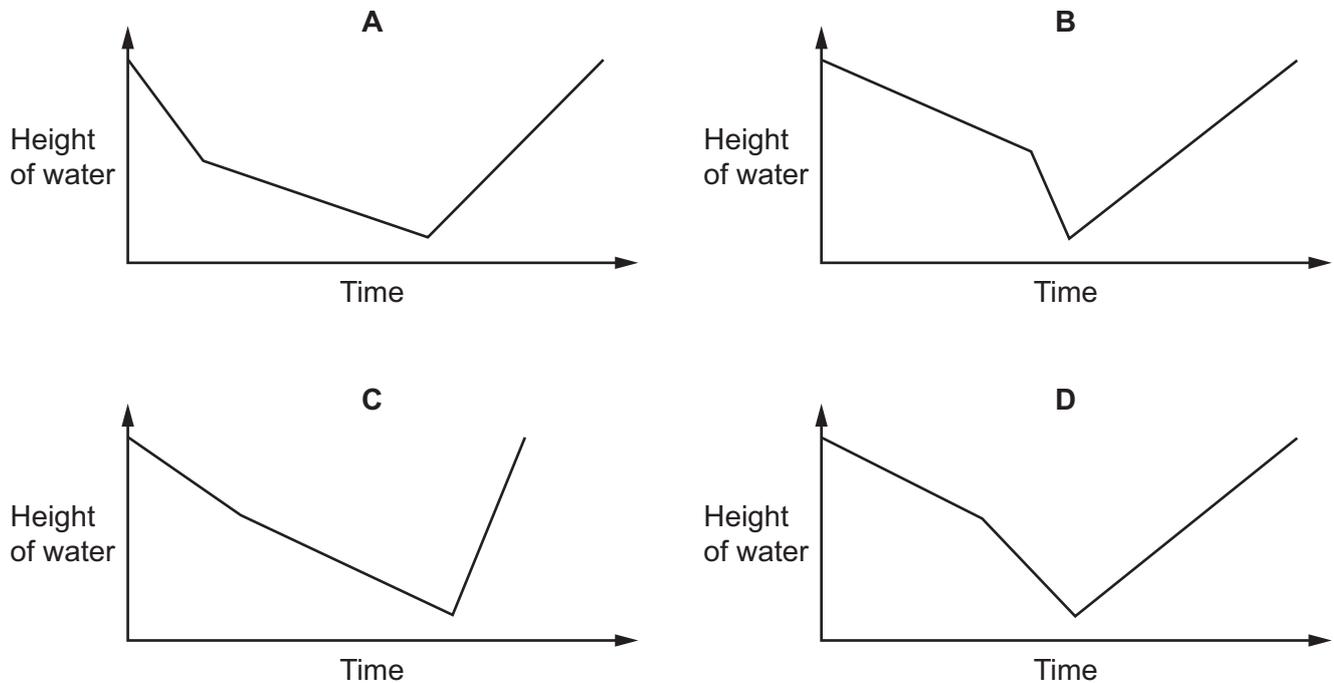
21 The diagram below shows 8 students, represented by dots, and which of three courses – Financial Skills, Ethics in Business, and Marketing – they are studying at a university.
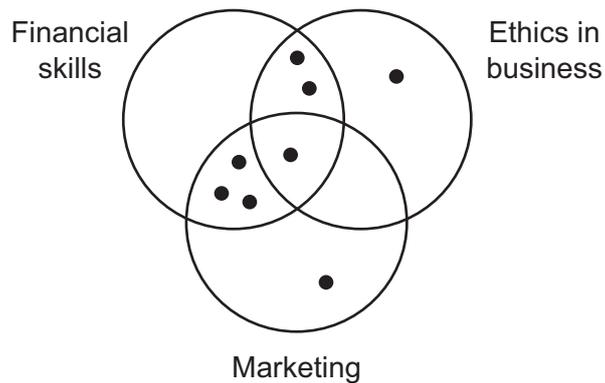
Which table below shows the courses which these 8 students are studying?

A

Student	Financial Skills	Ethics in Business	Marketing
Alex			✓
Leillah	✓	✓	✓
Mark		✓	
Nick	✓		✓
Radiyah	✓		✓
Rita		✓	✓
Stef	✓		✓
Tim	✓	✓	

B

Student	Financial Skills	Ethics in Business	Marketing
Alex	✓	✓	✓
Leillah		✓	
Mark	✓		✓
Nick	✓		✓
Radiyah	✓	✓	
Rita	✓		✓
Stef	✓	✓	
Tim			✓

C

Student	Financial Skills	Ethics in Business	Marketing
Alex	✓		✓
Leillah		✓	
Mark	✓		✓
Nick		✓	✓
Radiyah	✓		✓
Rita	✓	✓	
Stef	✓		✓
Tim	✓	✓	

D

Student	Financial Skills	Ethics in Business	Marketing
Alex	✓	✓	✓
Leillah	✓		✓
Mark	✓	✓	
Nick	✓		✓
Radiyah	✓		
Rita			✓
Stef	✓		✓
Tim		✓	

22 When asked for $3.53 at a shop yesterday, I pulled the loose change out of my pocket to discover that I had the following coins:

$$2 \times \$1$$
$$3 \times 50¢$$
$$4 \times 20¢$$
$$3 \times 10¢$$
$$2 \times 5¢$$
$$1 \times 2¢$$
$$5 \times 1¢$$

I decided to pay the exact amount from this loose change, using as many coins as possible, to lighten the load in my pocket.

How many coins did I have left after I had paid for my purchases?

A 4

B 5

C 6

D 8

23 Two different types of cake are on sale at prices of 30¢ and 40¢ each. The cakes that are being sold for 30¢ cost 20¢ to make and the ones for sale at 40¢ cost 25¢ to make. No cakes can be kept to be sold the next day, so all of the cakes are reduced to half price 2 hours before the sales finish.

All of the 30¢ cakes sold out before any of the prices were reduced, and all of the 40¢ were eventually sold, even though only half had been sold when the price was reduced. The overall profit at the end of the day was $30, but it could have been $40 if all of the cakes had sold before the prices were reduced.

How many of each type of cake were there in the sale?

A   150 cakes at 30¢ and 50 cakes at 40¢

B   150 cakes at 30¢ and 100 cakes at 40¢

C   200 cakes at 30¢ and 50 cakes at 40¢

D   250 cakes at 30¢ and 100 cakes at 40¢

24 The retirement age in Bolandia will be raised from 66 to 67 over two years: every six months the minimum age will jump up by 3 months. Anyone over the retirement age on the date they apply will immediately get a free retired-person's bus pass.

How much **younger** could one person with a free retired-person's bus pass be than someone not able to get one?

A   It's not possible to be younger

B   Just under 3 months

C   Just under 6 months

D   Just under 1 year

25 An ice cream seller, in a park, consistently sells between 500 and 600 ice creams in an evening. He has five different ice creams on offer. They vary in popularity. He estimates that any evening between 25% and 35% of customers ask for strawberry, between 20% and 30% chocolate, 15% and 25% vanilla, 10% and 20% raspberry, and 5% and 15% pistachio.

If the ice cream seller's estimates are correct, what is the minimum stock of ice creams that he should carry every evening to ensure that all his customers get the flavour they ask for?

A   600

B   625

C   700

D   750

26 Patrick has a savings account into which he puts $500 on the 15th day of each month. On the last day of each month the bank pays him interest of 1% on any money that was in the account for the whole of the month.

Immediately after the interest had been paid at the end of January, Patrick had exactly $3000 in his account. Immediately after the interest had been paid at the end of February, Patrick had exactly $1510 in his account.

Patrick only withdrew money from his account once in February, on the 10th. How much did he withdraw?

A $1990

B $2000

C $2010

D $2020

27 Six student friends were discussing their favourite musical composer. Two chose Bach, two chose Mozart and two chose Verdi. Anne, who chose Verdi, was surprised that none of Charles, Ethel and Fred chose Verdi. Equally, Fred was surprised that Anne, Buzz and Charles did not choose the same as him.

Which of the following sets of information, on its own, would be sufficient to enable one to be certain of all six students' favourite composers?

A Buzz chose Verdi and Charles chose Bach

B Buzz chose Verdi and Dave chose Bach

C Charles chose Bach and Fred chose Mozart

D Dave chose Bach and Fred chose Mozart

28 Amy, Bess and Curly were the three candidates for election to President of the Gumley Players. The voting system is a little unusual. A voter can choose either to give 5 points to one candidate and 0 to the other two, or to give 4 points to one candidate, 2 points to another and 0 to the third. Twenty people voted and the total points scored by each candidate were as follows:

Candidate	Total points
Amy	60
Bess	36
Curly	7

Amy was elected and it turned out that 13 of the voters gave her points.

How many voters gave 5 points to Bess?

A 2

B 4

C 6

D 7

29 There is an escalator in the underground station which I use on my way to work. I normally climb the escalator at 1 step per second, and at 1 pace per second. This takes me 15 paces to reach the top. Sometimes (if I am in a hurry) I still take 1 pace per second but climb 2 steps with each pace. This takes me 12 paces to reach the top.

One day, the escalator has broken down and I walk up 1 step at a time. How many steps are there?
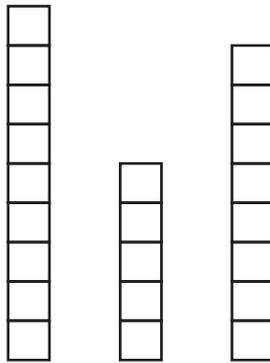
A 33

B 36

C 54

D 60

30 One of the exhibits in the Hirmin Gallery of Modern Art is called "Pot Luck". It consists of paint pots in 9 stacks, each stack containing a different number of pots between 1 and 9 inclusive.
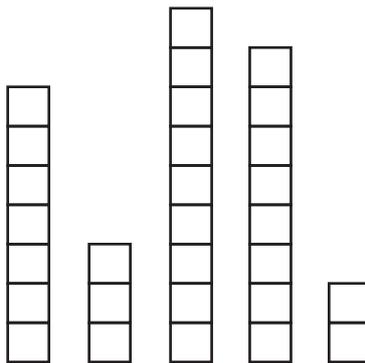
From above its appearance is:

X ⟶

Y ⟶
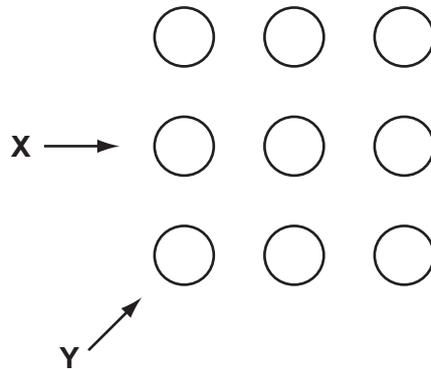
Side-on, from directions **X** and **Y**, it appears as follows:

from **X**

from **Y**

How many pots are there in the stack nearest to the viewer in the appearance from direction **Y**?

A   1

B   4

C   6

D   9

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20

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