THINKING SKILLS **9694/12**

Paper 1 Problem Solving **October/November 2011**

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.

INFORMATION FOR CANDIDATES

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

This document consists of **19** printed pages and **1** blank page.

[Turn over

1 I buy my sandwiches for each day from the work canteen. The prices are shown in the table below.

Filling	Small roll	Large roll	Baguette
Cheese	$1.00	$1.20	$1.50
Egg	$1.20	$1.50	$1.80
Beef	$1.80	$2.00	$2.20
Chicken	$1.80	$2.00	$2.50
Ham	$2.00	$2.50	$2.80
Pork	$2.20	$2.50	$2.80
For salad add	20¢	30¢	50¢

I plan to have a large cheese roll on Monday and Thursday, a chicken baguette with salad on Tuesday and a large egg roll on Wednesday and Friday.

The canteen has a special offer: if I order all of my sandwiches for the week then I will get the cheapest one free.

How much will I need to pay for my sandwiches for the week?

A $6.00

B $6.70

C $7.20

D $8.40

2 The table shows the prices of goods in a shop that takes cash in the form of euros (€) or dollars ($).

Jackets €60 ($90)	Long skirts €50 ($75)	Short skirts €30 ($45)	T-shirts €10 ($15)
Scarves €6 ($9)	Hats €8 ($12)	Gloves €8 ($12)	Leggings €12 ($18)
10% discount on total purchases exceeding €100 ($150)			

Bess wants to buy a jacket, a short skirt and three T-shirts. She is only carrying dollars but could exchange dollars for euros next door at the rate of €1 = $1.25. She decides to buy with dollars the exact amount of euros she needs to buy the clothes she wants.
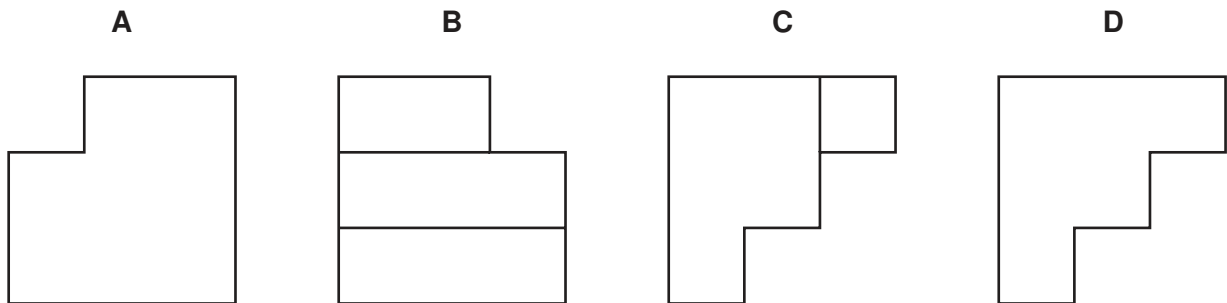
By making this change, how many dollars does she save compared to buying the goods with dollars at the clothes shop?

A 18

B 27

C 30

D 45

3 This is a drawing of a 3-dimensional sculpture.
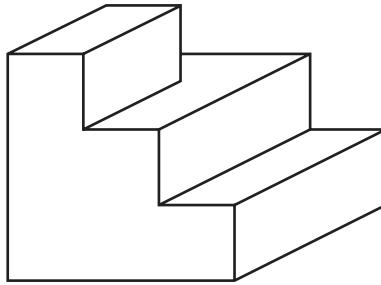
Which one of the following is **not** the view of a face of the shape in 2 dimensions?

A	B	C	D

4 Four supermarkets are in competition and regularly have special offers on basic food products as a way of attracting customers. The latest promotion of special offers features 500-gram pots of yoghurt.

ASCO
Buy 2 get
3rd free
80 cents
each

TESDA
Buy 1 get
2nd free
$1
each

SAINSONS
Buy 3 get
4th free
60 cents
each

MORRISBY
Buy 3 for
price of 2
90 cents
each

Which supermarket's special offer will give the customer the lowest price per 500-gram yoghurt pot?

A ASCO

B MORRISBY

C SAINSONS

D TESDA

5 I drive 120 000 km every year and I want to reduce costs on tyres. Tyres wear unevenly in cars unless tracking is done. Tracking costs $20 for the whole set of four tyres, and has to be done after every 40 000 km or the tyres will wear unevenly and will only last another 10 000 km. Tracking is provided free when you buy a new set of four tyres.

I need a new set of four tyres on my car which I am only keeping for a year until I sell it on. The following are details of the cost of different kinds of tyres and their lifespan. I have decided that when I choose an option, I will only use one kind of tyre.

Tyre	Price in $ per tyre	Lifespan in km
Sidon	55	40 000
Tredwell	70	60 000
Groundhug	80	80 000
Werewell	135	120 000

How much is the minimum I have to pay for tyres and tracking for the next year?

A $560

B $580

C $600

D $660

6 The tourism office has decided to allow companies to sell models of the town hall as souvenirs to visitors. They have decided that the guide price should be $2.50 per model for the first 1000 models, and $1.00 per model thereafter. The companies are allowed to vary their prices by up to 20% above or below the guide price.

In which one of the following graphs does the shaded region represent the range of incomes that the companies can expect to receive for the models?
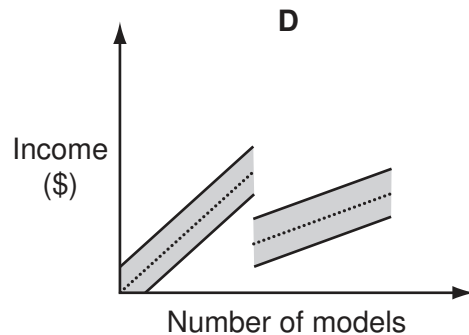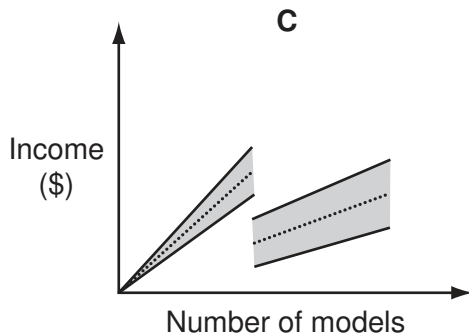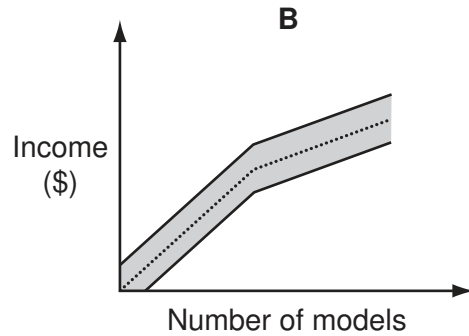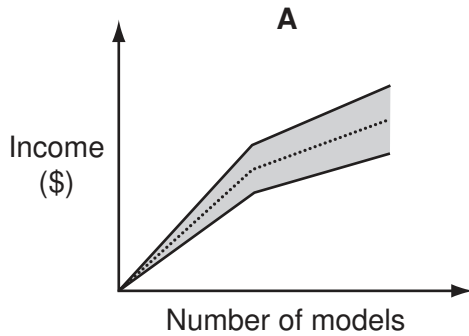
7 Ali and Ben are playing card games. They have 14 chocolate bars to share and decide they will play four games, the prizes for the winner of each game being 2, 3, 4 and 5 bars in order of play. Games cannot be drawn.

At the end, Ali has 9 chocolate bars.

Which game can we be certain Ali won?

A The 1st game

B The 2nd game

C The 3rd game

D The 4th game

8 Mobile phones use the following keys for forming words when sending text messages.

2	3	4	5	6	7	8	9
ABC	DEF	GHI	JKL	MNO	PQRS	TUV	WXYZ

To form the word RED, for instance, requires 7 to be pressed three times, 3 to be pressed twice, then 3 to be pressed once more.

Which key is pressed most times altogether when the word ACTIVATION is formed?

A 2

B 4

C 6

D 8

9 On a street corner across from my office there is a digital display that alternates between time and temperature. It shows the time for 20 seconds, then the temperature for 10 seconds. For instance, as I left work yesterday I saw

Followed by

The display is visible from the window of my office. Today something has gone wrong and it is showing time and temperature simultaneously.

At present I can see

I know from my own clock that the time is 14:12.

Which one of the following could **not** be the current temperature?

A 13°C

B 15°C

C 17°C

D 19°C

9694/12/O/N/11

10 Two examples of pyramid puzzles are shown below. The sum of the values of two boxes below is placed in the box above and so on. The object is to find all the values to the top of the pyramid. The values of *w*, *x*, *y*, *z* are not necessarily the same in both puzzles.

Pyramid 1: 67, y, w, 26, 10, z, x, 17, 9, 1, 20

Pyramid 2: 115, x, y, z, 25, 30, w, 5, 20, 10, 20
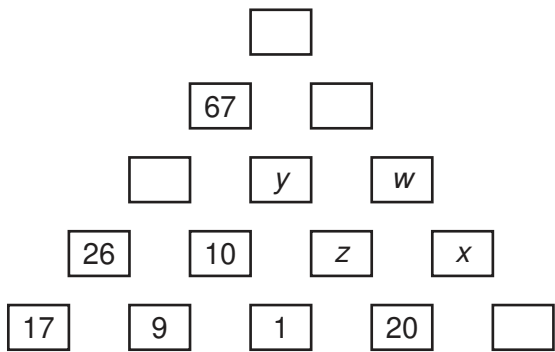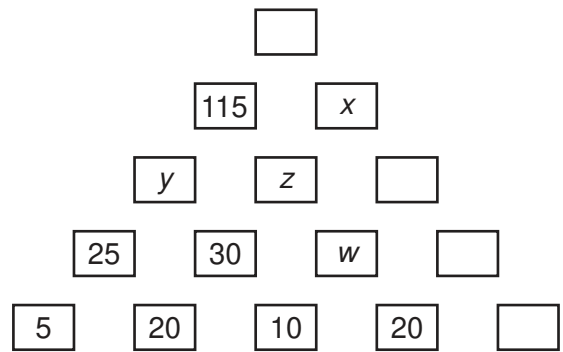
Pyramid 1   Pyramid 2

Which one of the following, if given, will enable all the box values to be found for both pyramid puzzles?

A The value of *w* in each puzzle.

B The value of *x* in each puzzle.

C The value of *y* in each puzzle.

D The value of *z* in each puzzle.

11 I want to buy a box of chocolates as a gift for a friend. There are 5 different types of chocolate that I can choose. The prices are 2¢, 4¢, 8¢, 10¢ and 16¢ per chocolate. The box will hold 24 chocolates in total and I am allowed to select any combination of chocolates to fill the box. I will not necessarily buy all 5 types of chocolate, but I want to make sure that, for each type of chocolate I buy, there are at least 4 chocolates and no more than 6. I want the price of the box to be as close as possible to $1.50.

How far from $1.50 will the price of my box be?

A 0¢

B 4¢

C 6¢

D 10¢

12 The local swimming pool allows customers to pay for individual visits (cost $3), or to buy a monthly card (cost $32) that allows the holder of the card to make up to 15 visits, without further payment, in the particular month for which the card is valid. The monthly card is not transferable between people. The Smith family has four members, Alex, Beth, Chuck and Dave. Alex goes to the pool 5 times per month, Beth 10 times, Chuck 12 times, and Dave 18 times.

To keep the cost of swimming as low as possible, how many cards should the Smiths purchase each month?

A Zero cards

B One card

C Two cards

D Three cards

13 There are two taxi companies in my town. One taxi company charges a fixed charge of $2.00, plus a further 10¢ for each complete kilometre travelled. The second company charges a fixed charge of $1.00, plus a further 10¢ for each complete 500 metres travelled. Yesterday I took taxis to the supermarket and back. I used one company on the way out and the other company on the way back. Both taxis took the same route. The total cost of my two journeys was $4.60.

What is the smallest price I could have paid for my two journeys if I had used the cheaper taxi company?

A $2.60

B $3.10

C $3.60

D $4.20

14 Every month, when I pay my rent, the landlord gives me a bill for utilities. I know that all fixed charges are included in my monthly rent, so my extra bill for each utility is calculated by multiplying the number of units that I have used by the price per unit. I do not know which of gas, electricity and water I am being charged for. In the last four months I have recorded the number of units of each that I used and the amount that I was charged by the landlord.

Electricity (units)	*Gas* (units)	*Water* (units)	*Landlord's bill* ($)
50	71	32	2.77
53	71	34	2.81
50	71	28	2.69
54	74	35	2.92

What am I being charged for?

A Electricity and gas.

B Electricity and water.

C Gas and water.

D Electricity, gas and water.

15 In the first phase of the annual Kolfeit Ice Hockey Tournament the 32 participating teams are divided into 8 groups of 4. In each group all the teams play each other once.

The group winners progress to the knockout phase, which consists of quarter-finals, semi-finals and the final. This means that all the teams play at least 3 matches, whilst the two teams that contest the final play 6 matches.

As well as the winners' trophy, there is also an award made to the team with the highest average number of goals scored per game during the tournament. This year's 'highest average' award was won by the Blizzards, with an average of 4.75 goals per match.

How far did the Blizzards progress in this year's tournament?

A Not beyond the first phase

B To the quarter-finals, but no further

C To the semi-finals, but no further

D To the final

16 Imperfections in the manufacturing process mean that there are slight variations in the dimensions of machined parts. The range of the sizes of the parts in four batches of shafts and holes was measured accurately.

Which one of the four batches shown below will contain parts such that some of the shafts will not fit in all the holes?

	Range of shaft sizes	*Range of hole sizes*
Batch 1	50.000 – 50.100	50.000 – 50.050
Batch 2	49.900 – 50.000	50.010 – 50.050
Batch 3	49.900 – 49.950	50.000 – 50.050
Batch 4	49.900 – 49.950	49.950 – 50.000

A Batch 1

B Batch 2

C Batch 3

D Batch 4

17 The square piece of paper shown below has five holes cut into it. It is folded so that the two circles overlap.
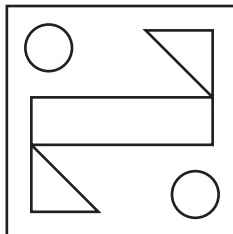
Which diagram shows what the resulting paper could look like?

| A | B | C | D |
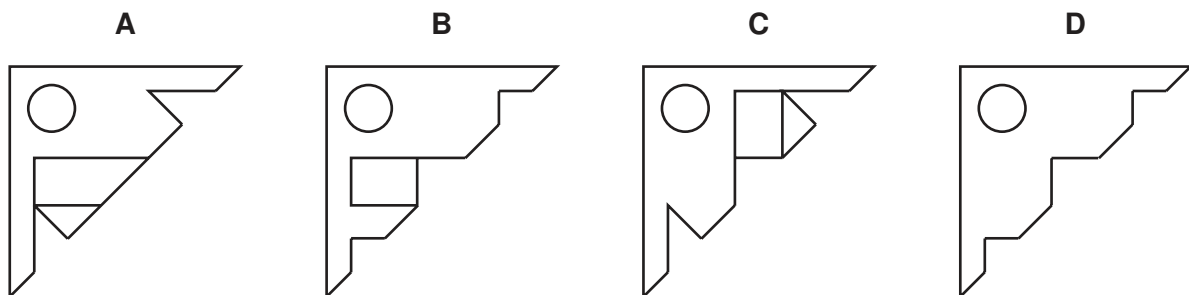
18 In the county of Buswise there are a number of bus routes between neighbouring towns. Each route starts at one town and finishes at another without any intermediate stops. The table below gives the prices of travel in dollars on all such routes. Empty cells indicate that there is no direct bus between two places, but by changing buses at destinations it is possible to travel by bus between any of the eight towns.

	Alton	Buton	Cuby	Dodle	Exe	Frist	Goby	Hox
Alton		6	7	8				
Buton	6				13			
Cuby	7				12		13	
Dodle	8				11	13	9	
Exe		13	12	11				15
Frist				13				11
Goby			13	9				13
Hox					15	11	13	

What is the least cost for which you could travel by bus between Alton and Hox?

A $30

B $32

C $33

D $34

19 1 litre of 'Orange Burst' paint is made by mixing red and yellow paint in the ratio 2 : 3. The person mixing the paint mistakenly reverses the ratio of red to yellow. The mistake can be rectified by adding an amount of yellow paint.

How much yellow paint must be added to the 1 litre mixture to obtain the correct colour for 'Orange Burst' paint?

A 0.4 litres

B 0.5 litres

C 0.6 litres

D 0.9 litres

12

20 During my holiday in Bolandia I want to see the Great Kings, four spectacular waterfalls known as Alexander, Charles, Darius and Frederick.

I have been told that the sum of the heights of Charles and Darius is exactly twice the height of Alexander, whilst the sum of the heights of Darius and Frederick is exactly three times the height of Alexander.

Based on what I have been told, which is the only one of the following that can be confirmed?

A Alexander's height is greater than Charles's.

B Charles's height is greater than Darius's.

C Darius's height is greater than Frederick's.

D Frederick's height is greater than Alexander's.

21 The Hurricanes have made an excellent start to the new football season. They have won all five matches played so far, scoring a total of 29 goals. Remarkably, they have scored a different number of goals in each match.

Which one of the following additional pieces of information is sufficient **by itself** to enable deduction of the five different numbers of goals scored so far this season by the Hurricanes?

A In their first match they scored 7 goals.

B In their most recent match they scored 5 goals.

C Their highest score is 8 goals.

D Their lowest score is 3 goals.

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https://xtremepape.rs/

22 A hollow cube has holes drilled through each face in the patterns shown to represent the numbers 0 to 5:
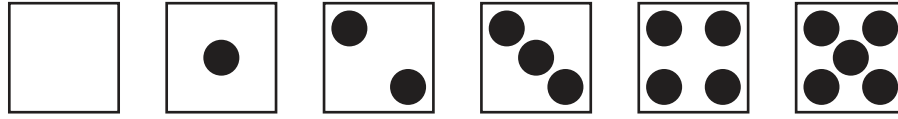
When the cube is placed on the table it is possible to see holes in the bottom face if they are directly beneath the ones in the top face. Three views of the cube from the top are shown here.
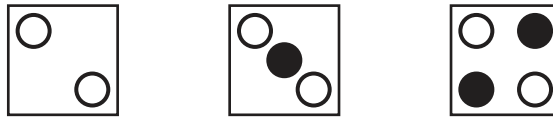
○ represents a hole where there is another hole directly beneath it.

● represents a hole in the top face whithout another hole directly beneath it.

What number is on the face opposite the 5?

A   0

B   1

C   2

D   3

23 A motor car assembly plant has a target of completing 3000 four-wheeled cars a month. The only car parts stopping the target from being met this month are the tyres. Due to production problems with the main tyre supplier, they will only deliver 7000 tyres this month. However, two other suppliers, who were scheduled to supply 1000 and 2500 tyres respectively, will increase their delivery of tyres by 20% to meet the shortfall. A thinner type is used for spare tyres, and they have plenty of these.

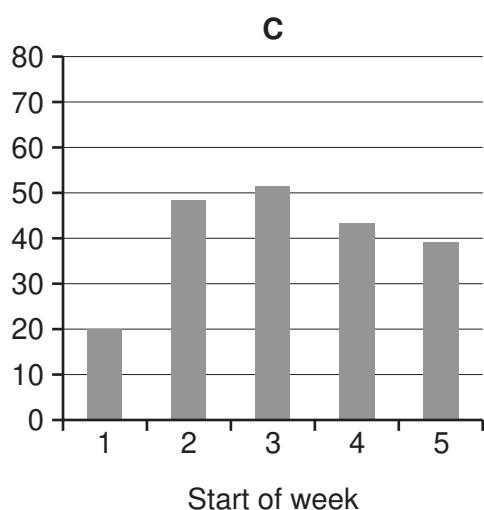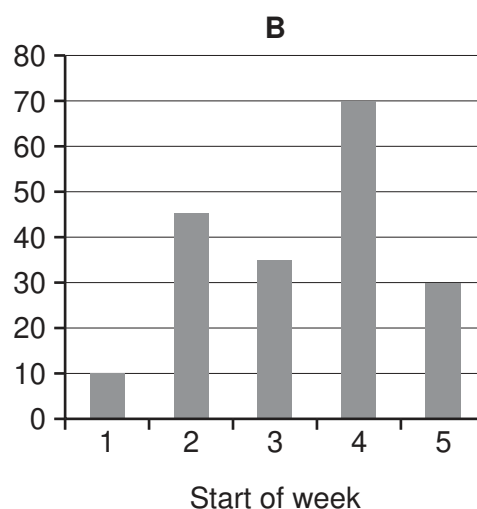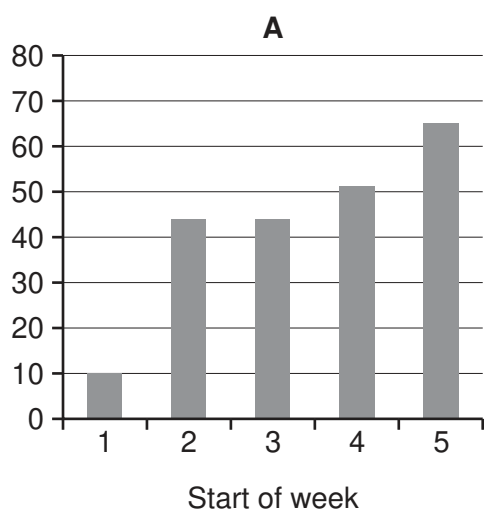How many cars short of the target will they be this month?

A   200

B   375

C   800

D   1075

24 Books can be borrowed from the library for 2 weeks at a time. Books are always out of the library for at least one week but are often returned after just one week rather than two. During each of the last 4 weeks the following numbers of books have been taken out.

Week 1 – 40
Week 2 – 32
Week 3 – 43
Week 4 – 28

All of the books were returned on time, or early.

Which one of the bar charts could **not** represent the number of books that were out of the library at the start of each week?

A

Start of week	1	2	3	4	5
Books	10	44	44	51	65

B

Start of week	1	2	3	4	5
Books	10	45	35	70	30

C

Start of week	1	2	3	4	5
Books	20	48	51	43	39

D

Start of week	1	2	3	4	5
Books	20	45	65	70	75
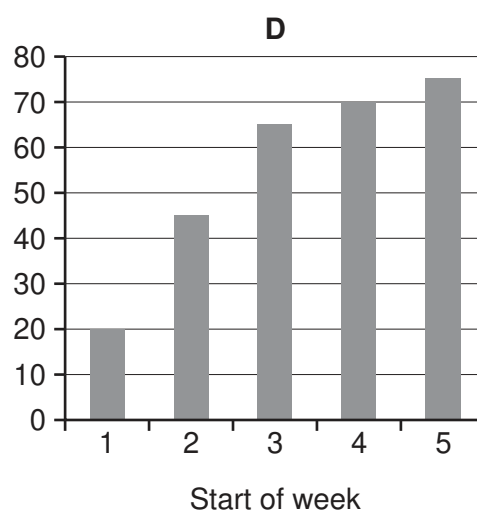
25 A non-stop train service connects Parlour and Scullery, the two largest towns in Roomania. The journey distance is 57 kilometres.

Trains depart from the stations at Parlour and Scullery simultaneously, once an hour. Their speed is restricted to 30 kilometres per hour while they are within 3 kilometres of Parlour station, and 45 kilometres per hour while they are within 3 kilometres of Scullery station; otherwise they travel at 90 kilometres per hour.

How far from Parlour station are the two trains when they pass each other?

A   22 kilometres

B   24 kilometres

C   27 kilometres

D   28 kilometres

26 One of the checks made by the online Bolandia bank is to put up four of ten possible pictures and ask which one is the one chosen by the customer. A hacker who is able to tell which pictures are being offered, but not which one is selected, soon realises that there are two people using the same terminal for their banking.

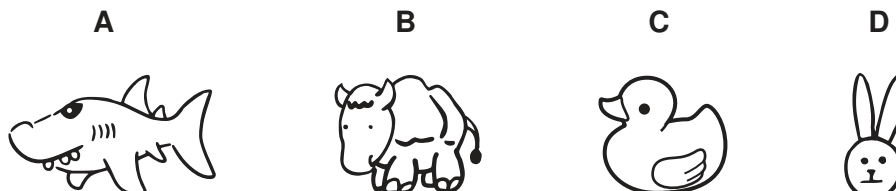He sees the following four challenges:
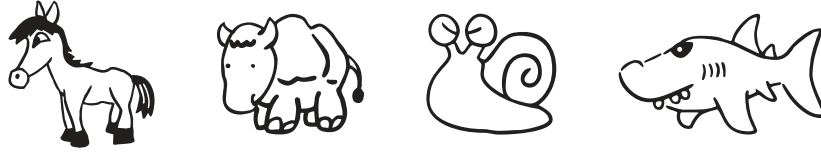
then

and
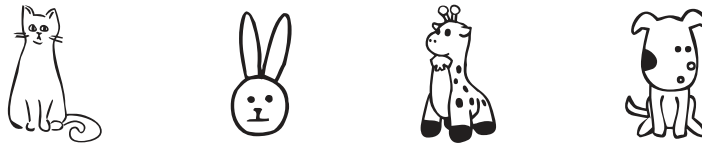
followed by

The next challenge is

Which is the correct answer?

A	B	C	D

27 Charles's journey from his home to his school takes a varying amount of time depending on when he leaves, the volume of traffic on the roads, the weather, and how late the bus is when it arrives. The longest bus journey time is 35 minutes, the average 25 minutes, and the shortest 20 minutes. The bus, which is timetabled to run every 15 minutes, can be as much as 12 minutes late. He has to arrive at school no later than 08:00 to ensure he is able to go on a school trip.

Given that his walk to the bus stop takes just under two minutes, at what time must he leave home to make sure he is able to go on the school trip?

    A   06:56

   **B**   07:02

    C   07:06

    D   07:08

28 Suspecting that people tend not to buy things that are too cheap (probably because they suspect poor quality), as well as things that are too expensive, Alistair conducted an experiment in pricing.

He arranged for 15 shops to sell the same sunglasses at different prices for one month.

These are the results:

Shop descriptor	Price	Number sold
SGA	$14	75
SGB	$6	51
SGC	$26	31
SGD	$12	71
SGE	$24	43
SGF	$2	25
SGG	$16	78
SGH	$30	6
SGI	$22	55
SGJ	$18	80
SGK	$4	41
SGL	$20	68
SGM	$8	59
SGN	$28	19
SGO	$10	66

Which one of the following best fit lines illustrates Alistair's results?

A

Number sold / Price

B

Number sold / Price

C

Number sold / Price

D

Number sold / Price
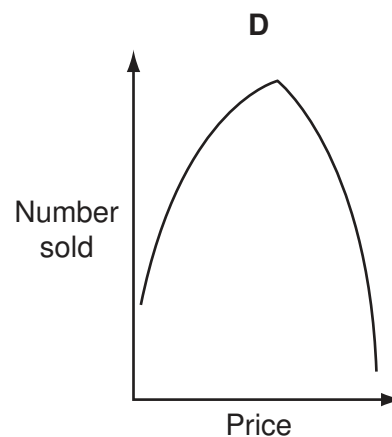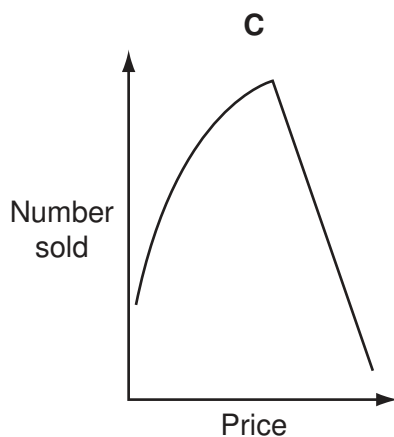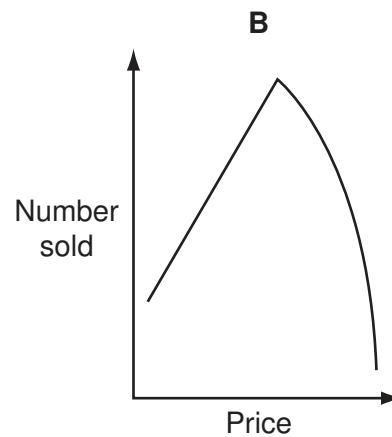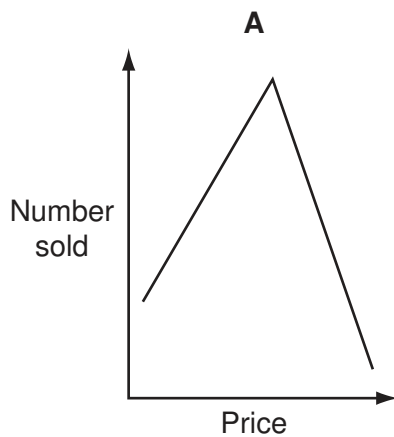
29 Alex, Brian and Charles competed in a triathlon. After the swimming and cycling, Alex started the run 15 seconds after Brian and 30 seconds after Charles. Brian ran 0.5 m/s faster than Alex.

Which one of the following additional pieces of information is sufficient to be able to work out the finishing order of the race?

A   Brian finished 10 seconds before Charles.

B   Brian finished 30 seconds before Charles.

C   Charles ran at 7.5 m/s.

D   Brian ran at 7.5 m/s.

30 The minute hand of one of my clocks travels faster 'downhill' than 'uphill'. It takes exactly 25 minutes to progress from 12 to 6, moving at constant speed, then takes exactly 36 minutes to return to 12 at a slower constant speed.

I reset the clock to the correct time every day at 12 noon (as shown by a clock that gives the correct time).

What time does the clock show every day at 12 noon, immediately before I reset it?

A   11:36

B   11:37

C   11:40

D   11:42

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