

KINGDOM OF BAHRAIN

NATIONAL AUTHORITY for QUALIFICATIONS
and QUALITY ASSURANCE of EDUCATION
and TRAINING

Directorate of National Examinations

Grade 12 National Examinations

مملكة البحرين

الهيئة الوطنية للمؤهلات و ضمان جودة

التعليم و التدريب

إدارة الامتحانات الوطنية

الامتحانات الوطنية للصف الثاني عشر

March 2015

امتحان مارس 2015

PROBLEM SOLVING

حل المشكلات

Paper 1 Problem Solving

الورقة 1 حل المشكلات

Duration: 90 minutes

مدة الامتحان: 90 دقيقة

Write your answer on the question paper.

اكتب الإجابة في ورقة الأسئلة.

Additional materials: ruler, pencil, eraser,
calculator.

الأدوات الإضافية: مسطرة، قلم رصاص، ممحاة،
آلة حاسبة.

Read these instructions first:

Use a blue pen only.

Attach your CPR label here

Do not write in the margin.

Answer **all** questions.

The use of calculators is permitted.

There are four options to each question. Select **one**
correct answer from the options by circling the letter
as follows:

B



Note:

Each correct answer will score one mark. Marks will
not be deducted for incorrect answers.

The total number of marks for this paper is 30.

This document consists of **32** printed pages.

- 1 A frozen yogurt shop allows the customer to choose one from each of the four available toppings in the following chart:

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Topping 1 Fruits	Topping 2 Nuts	Topping 3 Biscuits	Topping 4 Syrup
Blueberries	Walnuts	Twix Chunks	Chocolate
Raspberries	Pistachios	Oreo Chunks	Caramel
Blackberries	Almonds		Strawberry

Which of the following combinations is **not** allowed?

- A** Blueberries, Pistachios, Caramel Syrup and Oreo Chunks
- B** Chocolate Syrup, Oreo Chunks, Blackberries and Almonds
- C** Pistachios, Strawberry Syrup, Twix Chunks and Blueberries
- D** Twix Chunks, Pistachios, Raspberries and Walnuts

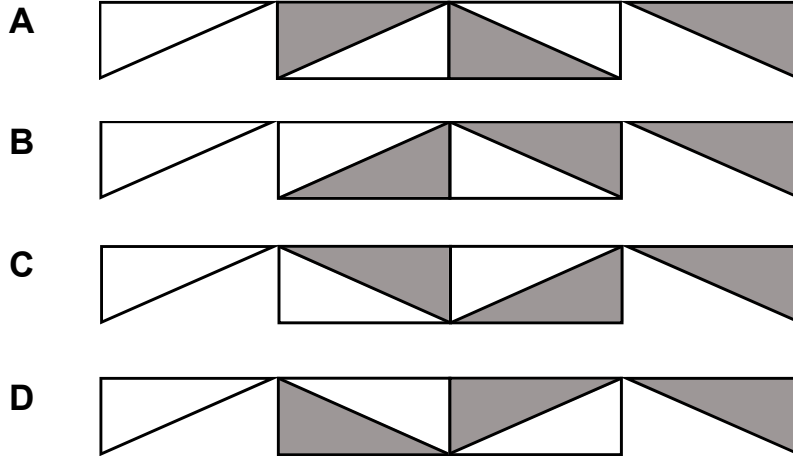


- 2 An architecture company designed a new logo, which is shown below.

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Which of the following shapes represents a reflection of the logo?



- 3 A small shop had a three month trial period of selling bakery items. The following table shows the breakdown of items sold during the first three months of 2014 :

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Month	January				February				March			
Week	1	2	3	4	1	2	3	4	1	2	3	4
White loaf	21	25	19	20	18	24	22	19	24	26	18	20
Brown loaf	14	18	19	16	15	14	20	18	15	18	20	19
Savoury pastry	16	20	24	18	18	22	19	17	19	20	18	16
Sweet pastry	12	14	10	16	10	14	18	12	16	14	15	12

What is the difference between the number of brown loaves sold in the first two weeks of January and the number of brown loaves sold in the last two weeks of March?

- A 1
B 4
C 7
D 8



- 4** The Millennium Boutique has a special offer on clothes: when you buy any 3 items, you pay half price for the cheapest item.

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Ahmed bought 3 items, for which he paid a total of BD 18. The full prices of two of the items were BD 4 and BD 9.

What was the full price of the other item?

- A** BD 5
- B** BD 7
- C** BD 10
- D** BD 11



- 5** In a public garden there is a walking area. Three friends went for a walk. They all started at the same point of the track. However, they all had different speeds.

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Which of the following makes it possible to calculate the number of laps they each had to do before they met in the same place they had started?

- A** The length of the track
- B** The direction in which each of them walked
- C** The time that they started walking
- D** The lap time for each of them



- 6** In a certain investment scheme, the value of the account doubles at the end of every year. On 1st January 2011 Noora invested 3 million dinars. On 1st January 2013 she added another 2 million dinars to the investment. She did not deposit or withdraw any amount of money at any other time.

What was the value of the account on 1st January 2015?

- A** 48 million dinars
- B** 50 million dinars
- C** 52 million dinars
- D** 56 million dinars

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7 A father asked his son to go to the fruit shop and gave him the following instructions:

- Buy 1 kg of apples – do not pay more than BD 1.000
- Buy 1 kg of oranges – get the best available
- Buy 1 kg of bananas – get the best available
- Buy 2 other fruits – 1 kg of each, but do not pay more than BD 1.000 combined

These are the prices offered by the fruit shop:

Fruit type	Price per Kilogram	
	The best brand (BD)	The normal brand (BD)
Banana	0.600	0.400
Grapes	2.400	2.000
Melon	1.800	1.400
Orange	0.650	0.450
Mango	0.500	-
Apricot	1.150	0.750
Tomato	0.750	0.400
Apple	1.200	0.800

What was the total price of the fruits that the son bought bearing in mind that he followed his fathers' instructions?

- A** BD 2.950
B BD 3.050
C BD 3.150
D BD 3.250



- 8 Qasim has booked a table for himself and a friend at a restaurant near to a cinema complex this evening. He has arranged to meet his friend outside the complex and he intends to watch a film first.

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Today's film programme is shown below.

Screen	Film	Starting times of film			Duration of film
1	Moonbeam	14:45	17:15	19:45	115 mins
2	Robot Dancer	14:50	17:10	19:30	99 mins
3	Wizard	14:20	17:00	19:40	125 mins
4	The Light Knight	14:30	16:40	18:50	82 mins

Which is the only information of the following additional pieces of information would **not** be required to help him decide which of the film he could watch all the way through?

- A The time is now 16:30
- B It will take him 20 minutes to get to the cinema complex
- C He has arranged to meet his friend at 19:00
- D The restaurant is booked for 19:15



- 9 In an educational contest aired on the local TV, the presenter hosting the contest asks 20 questions to each competitor. Points are awarded according to the following rules:

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- The competitor gets 5 points for every correct answer.
- The competitor does not get any points if he answers the question incorrectly.
- The competitor gets 1 point if he decides not to answer the question.

The competitor with the most points wins.

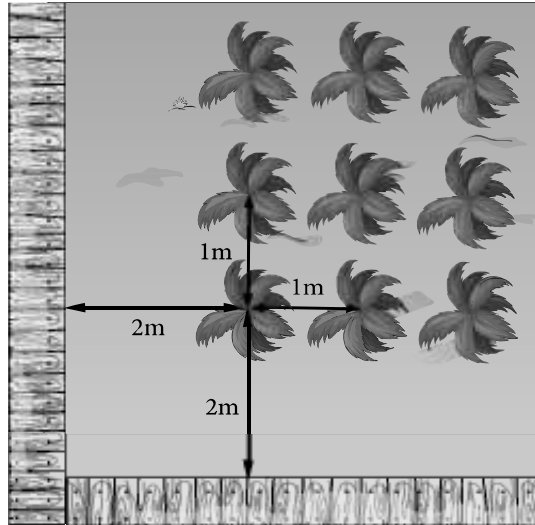
Which of the following **cannot** be the total number of points for a competitor at the end of the contest?

- A 92
- B 93
- C 95
- D 96



- 10** In a garden there are 15 rows of 12 trees. The rows are 1 m apart and the distance between trees in each row is also 1 m. A distance of 2 m is left from all sides of the boundary. The diagram below shows a corner of the garden.

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What are the dimensions of the garden?

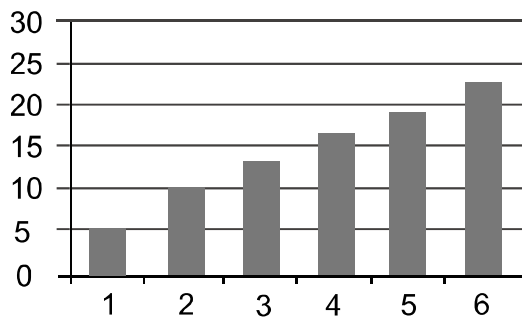
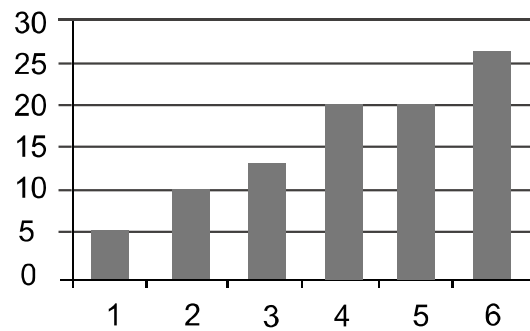
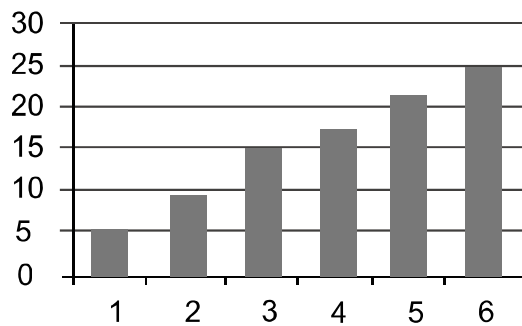
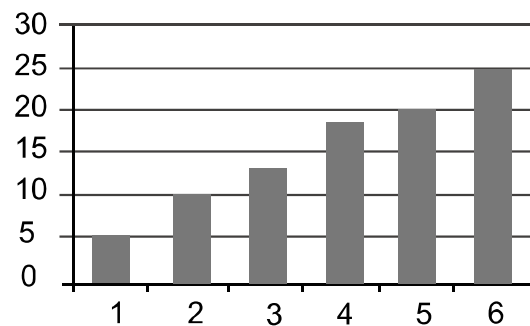
- A** 16 m x 13 m
- B** 17 m x 14 m
- C** 18 m x 15 m
- D** 19 m x 16 m



- 11** The tennis court at the local sports centre can be booked for 1 hour at a time. Each hour costs BD 5, but three hours can be booked for BD 13 and five hours can be booked for BD 20.

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Which one of the following charts shows how the cheapest price varies with the number of hours booked?

A**B****C****D**

- 12** A wholesaler sells mineral water bottles which are packed in carton boxes of three sizes. Each box includes 4, 9 or 15 mineral water bottles; the wholesaler sells only full boxes.

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Sarah will throw a graduation party where she will invite a group of family members and friends; she wants to buy exactly 50 mineral water bottles from the wholesaler.

What is the least number of boxes that Sarah needs to buy to cover the party she's having?

- A** 5
- B** 6
- C** 7
- D** 10



- 13** A newly built house has a living room with a rectangular floor, 10 m long and 8 m wide. The owner would like to tile it.

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Each tile is a square, with a length of 40 cm, and costs BD 2.

There is a charge for installation of BD 1 per square metre.

What is the total cost?

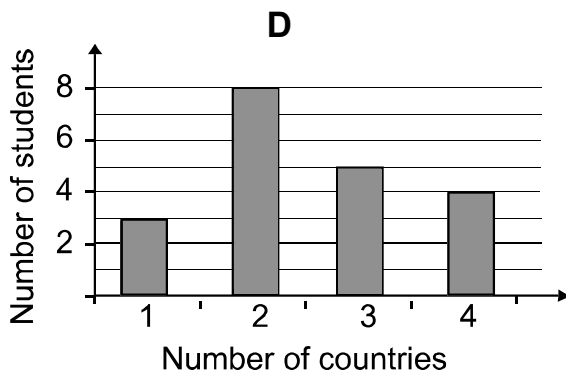
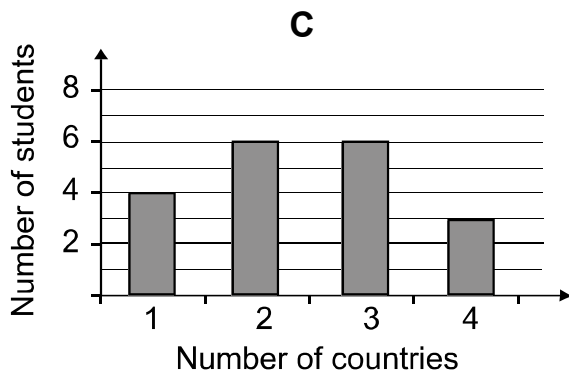
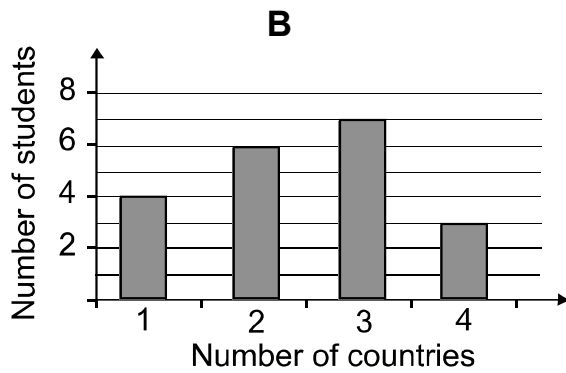
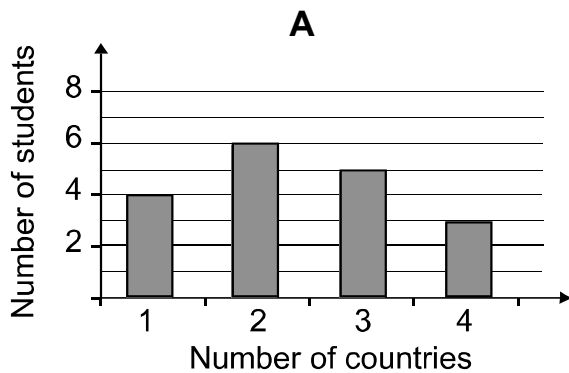
- A** BD 200
- B** BD 660
- C** BD 1080
- D** BD 1500



- 14** A mathematics teacher asked 20 students how many different countries they had visited. When he got their answers, he found that they had all visited at least one country, 30% of them had visited exactly 2 countries, but none of them had visited more than 4 countries.

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Which of the following charts below represents the students' data?



- 15** I need to produce 1000 leaflets to distribute. They must be on coloured paper and do not need to contain any pictures. I have been given quotations from three different companies as shown below (all prices are in BD).

Company	Price per 100 (white paper)	Price per 100 (coloured paper)	Extra charge for images (only counted once)
Company 1	2.000	3.000	5.000
Company 2	2.200	2.900	7.000
Company 3	2.100	2.700	8.000

Alternatively, I am prepared to produce the leaflets myself. I estimate that it will take me 3 hours to produce them and the cost for my time is BD 9 per hour. The resources will cost BD 5.

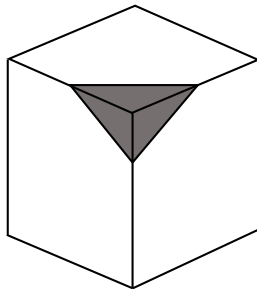
How does the price from the cheapest company compare with the total cost if I were to produce the leaflets myself?

- A** The company is cheaper by BD 12
- B** The company is cheaper by BD 5
- C** The company is more expensive by BD 3
- D** The company is more expensive by BD 13



- 16** Majed made a cube shaped carton by folding a net that he had drawn. He then painted one of the cube corners as shown in the figure below.

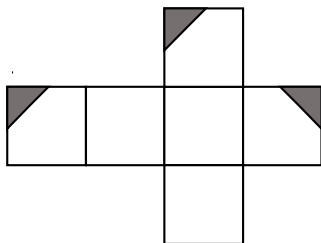
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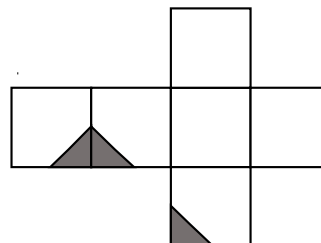
He then unfolded the cube back to the original net.

Which of the following nets could represent the cube that Majed unfolded?

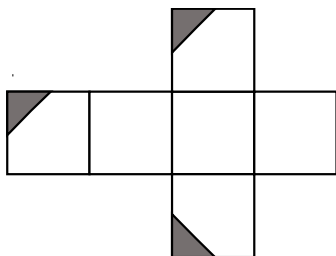
A



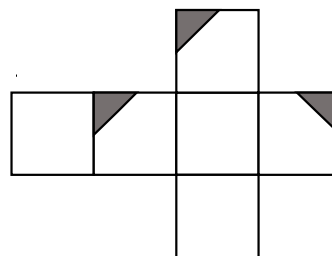
B



C



D



- 17** Khalid works as a carpenter at Al Hyidaya Decor workshop. He earns a monthly salary of BD 200. In addition he gets 10% of the profits of each deal he successfully completes. Last month Khalid was able to complete three deals and got a salary of BD 450.

Which of the following set of profits is consistent with Khalid's salary last month?

- A** BD 1100, BD 600, BD 1000
- B** BD 1500, BD 750, BD 250
- C** BD 950, BD 750, BD 1100
- D** BD 850, BD 600, BD 950

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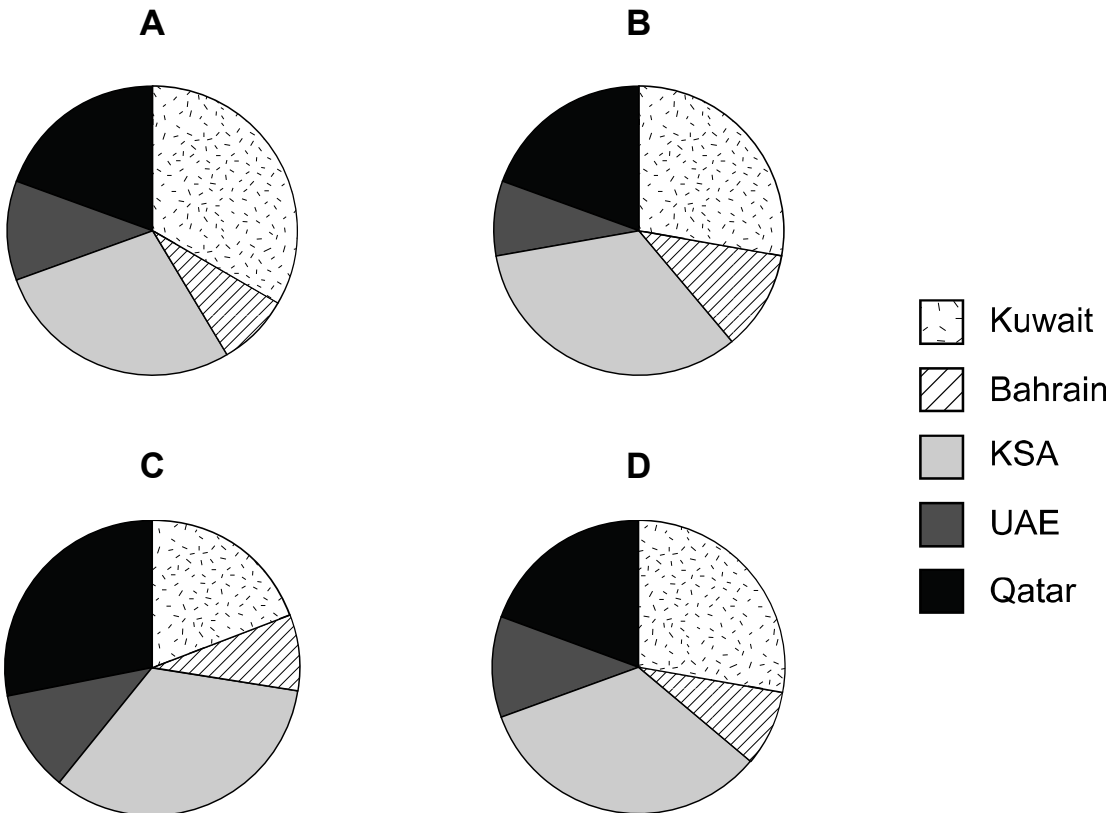


- 18 Last August, 360 tourists from five different countries visited the Old Castle Museum. The table below shows the number of visitors from each country.

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Country	Number of Visitors
Kingdom of Saudi Arabia (KSA)	120
United Arab Emirates (UAE)	40
Qatar	70
Kuwait	100
Bahrain	30

Which one of the following charts best represents the above information?



- 19** A mobile phone company calculates the bills for its customers on the basis of a price per minute for calls and a price for each text message sent. Customers are always charged a minimum of BD 15 per month, which is the price of 1000 minutes of calls and 200 text messages.

Nasser's bill for last month was BD 20. He sent 260 text messages during the month. One text message costs 25 fils.

How many minutes of calls did Nasser make last month?

- A** 900
- B** 1150
- C** 1350
- D** 1850



- 20** A certain university assesses its students with two tests and a final examination.

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25 marks for Test 1
25 marks for Test 2
50 marks for the Final Examination

The mark for only one of the two tests; Test 1 or Test 2 can be replaced by 50% of the mark for the Final Examination if that would increase the mark for that test.

Then three marks are added to give a total out of 100, which is then converted to a letter grade as shown in the table below.

Grade	Students' Marks out of 100
A	90 or more
B	80 or more
C	70 or more
D	60 or more

Wafa earned 20 marks on Test 1 and, due to illness, earned only 5 marks on Test 2.

What is the minimum score that Wafa needs to achieve in the final examination to get at least a B grade for the course?

- A** 34
B 37
C 40
D 47



- 21** Ali is travelling to Dubai tomorrow and has a bag of personal clothes (30 kg) and a box containing his study books (40 kg).

The airline company does not charge passengers for up to 20 kg of luggage. There is a charge of BD 2 for every extra kilogram above 20 kg. The passengers also have the choice to send their luggage through cargo for less cost.

Ali expected to pay BD 50 for the extra luggage but he managed to save out BD 8.

Which of the following could **not** explain Ali's savings of BD 8?

- A** Ali carried the bag on the airplane and sent the box by cargo arriving after 3 days for 550 fils per kilogram
- B** Ali sent both the bag and the box by cargo arriving after two days for 600 fils per kilogram
- C** Ali carried the bag on the airplane and sent the box by cargo arriving on the same day for BD 2.200 for every 4 kilograms
- D** Ali carried the box on the airplane and sent the bag by cargo arriving after two days for 600 fils per kilogram



- 22** A train started its journey at station W, travelling to station Z with stops at stations X and Y. At station X, half of the passengers got off and 210 new passengers got on. At station Y, one third of the passengers got off and 50 new passengers got on. When the train arrived at station Z there were 320 passengers on board.

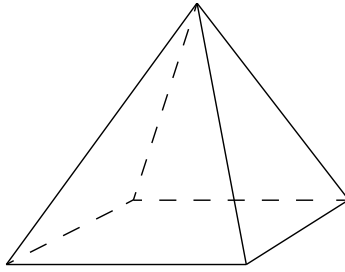
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How many passengers were on board as the train left station W?

- A** 225
- B** 390
- C** 650
- D** 1200



- 23 The drawing below shows a pyramid with a square base.



If the faces (including the base) are coloured either black or white, how many different possible ways of colouring are there? (A rotation of the pyramid does not count as a different way)

- A 10
- B 12
- C 14
- D 16

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- 24** A local furniture manufacturer is looking to increase his profit. For any item that he makes there is a cost for the materials, a cost to produce the pieces and a cost to assemble it. The following table shows the costs (in BD) for each stage of making an item of furniture for three proposed items:

Item of furniture	Materials	Production	Assembly
Sofa	460	60	80
Desk	305	50	45
Bookcase	140	40	20

When selling the products, he charges twice the cost of the materials. The available amount that he had and can spend on making the products is BD 2000 and wants to make as much profit as possible.

What is the maximum amount of profit that he can make?

- A** BD 1030
- B** BD 1040
- C** BD 1050
- D** BD 1060



- 25** A restaurant owner decided to reduce the service charge added to the price of meals from 20% to 10%. After the service charge was reduced the number of people eating in his restaurant increased.

When completing his accounts, the restaurant owner recorded each bill as the price of the meal and the service charge separately. The total amount received from meal prices increased by 10% after the reduction.

What happened to the total amount received from service charges after the reduction?

- A** It decreased by 45%
- B** It decreased by 1%
- C** It did not change
- D** It increased by 11%



- 26 There are three political parties in a country: the Red Party, the Blue Party and the Yellow Party.

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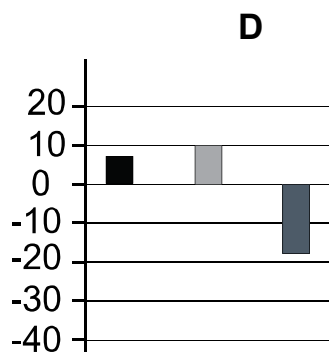
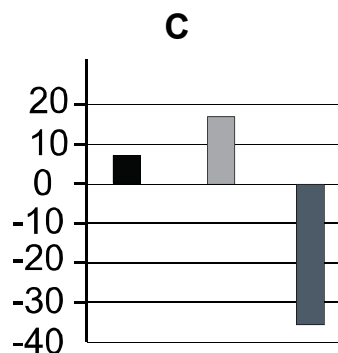
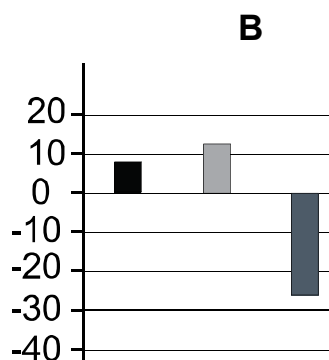
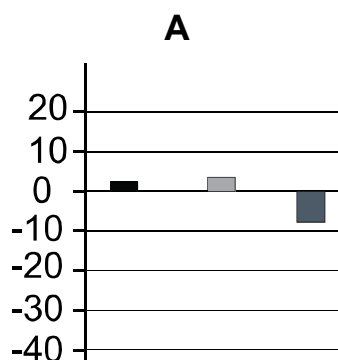
In the previous Parliament the situation was:

Red	99 seats
Blue	73 seats
Yellow	68 seats

Following the recent General Election the state of the parties in the new Parliament is:

Red	107 seats
Blue	83 seats
Yellow	50 seats

Which one of the following charts correctly shows the percentage change in the number of seats for each party?



■ Red Party
■ Blue Party
■ Yellow Party



- 27** My friend told me that the 1 m wide path around his rectangular lawn had exactly the same area as the lawn itself. The length and width of the lawn are both the exact numbers in metres.

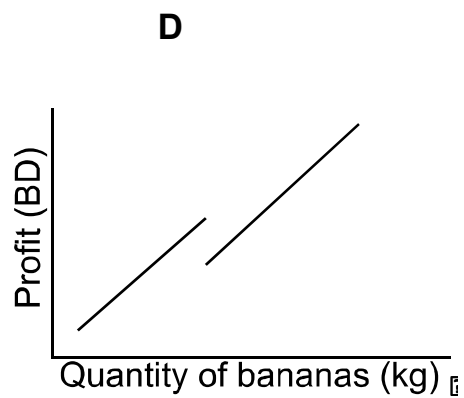
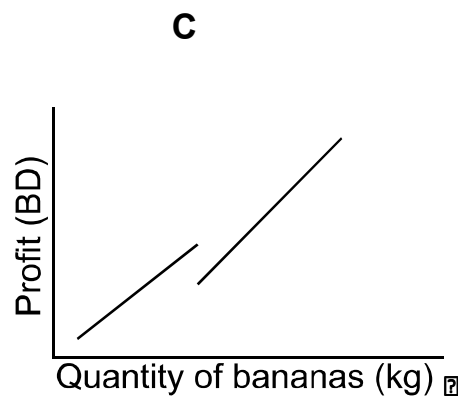
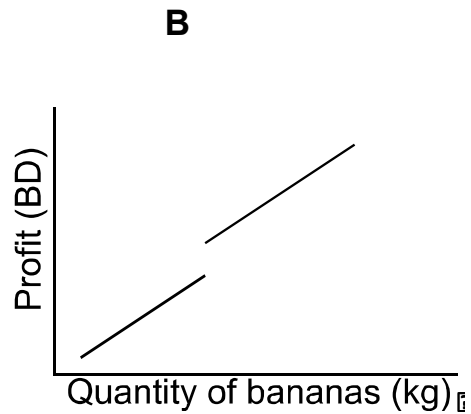
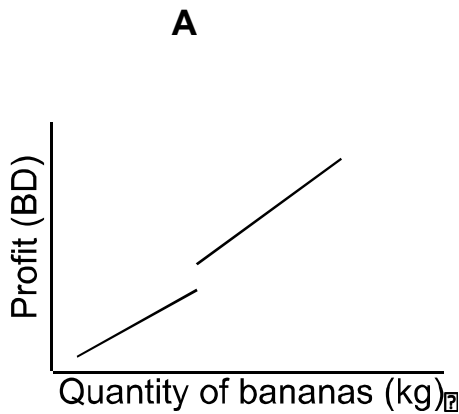
What is the smallest area his lawn could have?

- A** 16 m²
- B** 24 m²
- C** 30 m²
- D** 48 m²



- 28** Ahmed sells bananas in his shop at a price of 400 fils per kilogram. He buys the bananas from his supplier at a price of 250 fils per kilogram, but he receives a discount of 20% on the price of the whole order if he buys more than 30 kilograms.

Which of the following graphs show the relationship between the number of bananas that Ahmed buys and the profit that he could make from selling them?



- 29** Ibrahim left at 8:30 am heading from his house in the fifth complex to the Hilton health club; he rode his bike along the sea road that is 62 km long at a constant speed of 12 km/hr. At exactly 9:00 am on that day, Hassan left the Hilton health club taking the same road and heading to the fifth complex, he rode his bike at a constant speed of 16 km/hr.

What time will it be when they meet on the sea road?

- A** 10:30 am
- B** 11:00 am
- C** 12:30 pm
- D** 1:40 pm



- 30** The aim of golf is to complete each round in as few strokes as possible. Yousif led this year's Kutari Open Golf Championship at the end of the first round. In each round he took more strokes than in the previous one, but he still managed to keep the lead all the way through. After finishing the final round with 72 strokes he had a total of 277 strokes from his four rounds.

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Which of the following additional pieces of information would be sufficient by itself to enable you to deduce his number of strokes in each of the first, second and third rounds?

- A** He took 65 strokes in the first round
- B** He took 69 strokes in the second round
- C** He took 71 strokes in the third round
- D** He took 2 more strokes in the third round than in the second round



BH/PS12/01E

March 2015

PROBLEM SOLVING

Paper 1 Problem Solving

امتحان مارس 2015

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الورقة 1 حل المشكلات

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