The Haberdashers' Aske's Boys' School
Elstree, Herts

11+ Entrance Examination 2011

MATHEMATICS

Time : One Hour

Full Name .....

Candidate Number .....

Please follow these instructions

- Do not open this paper until you are told to do so.
- There are 30 questions on this paper. Do not forget to turn over.
- Work quickly but accurately. You are recommended to use pencil, but you can use pen or biro if you wish.

WRITE YOUR ANSWERS TO THE QUESTIONS IN THE SPACES PROVIDED.
YOU MAY USE THE SPACE AT THE BOTTOM OF EACH PAGE FOR WORKING.

Answer

1. Add: $48 + 27$ _____

2. Subtract: $91 - 25$ _____

3. Multiply: 62×7 _____

4. Divide: $92 \div 4$ _____

5. I have £8.17 credit on my mobile phone. At the end of a phone call this falls to £7.65. How much did the call cost? _____

6. The drink "Raspberry Heaven" is 1 part raspberry juice, 2 parts orange juice and 3 parts apple juice. How much raspberry juice does a 300 ml glass of Raspberry Heaven contain? _____

7. Work out the product of 528 and 99. _____

8. Barbie earns £23,450 a year and her partner Ken earns £700 less than Barbie. How much do the couple earn altogether? _____

9. Convert 7.4 kilograms into grams. _____

10. Arrange the following numbers in order of size starting with the smallest: 32.043, 0.099, 1.072, 0.491, 0.5

_____

11. The opening hours of my local supermarket are 7am to 9pm Mondays to Saturdays and 10:30am to 4:30pm on Sundays. For how many hours does this supermarket open each week? _____

12. Arrange the numbers, 5, 3, 7 and 2 to make the largest possible four-digit number which is a multiple of 5. _____

13. Work out 0.08 multiplied by 5. _____

SPACE FOR WORKING

Answer

14. The new TV channel, Lazy Living, broadcasts for 98 hours a week. If two-sevenths of its output is devoted to make-over programmes and the rest to celebrity gossip, for how many hours each week does the channel broadcast programmes on celebrity gossip? _____

15. For breakfast I eat a slice of buttered toast and a cup of coffee. The time taken to complete these activities is as follows:

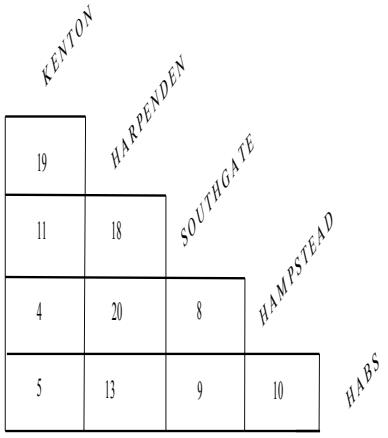
Brown toast in toaster	3 minutes
Butter the toast	1 minute
Make coffee in machine	2 minutes

Jonathan thinks that the shortest time taken for me to prepare my breakfast is 6 minutes. Explain briefly why Jonathan is wrong.

_____

What is the correct shortest time? _____

16. The chart below shows the mileage between five places in North London. For example it gives the distance between Kenton and Hampstead as 4 miles.



Daisy lives in Hampstead and drives her son to school at Haberdashers' in the morning before continuing on to the office in Southgate. She then visits her sister in Harpenden before driving home via Habs. How far does she travel altogether?

_____

SPACE FOR WORKING

Answer

17. The rate of VAT (value-added tax) in this country is 20%.
In the shop CoCost, the price of a TV excluding VAT is £550.
Work out the cost of the TV after the VAT is added on. _____

The price of a diamond ring, including VAT is £1200.
Work out the cost of the ring before the VAT was added on. _____

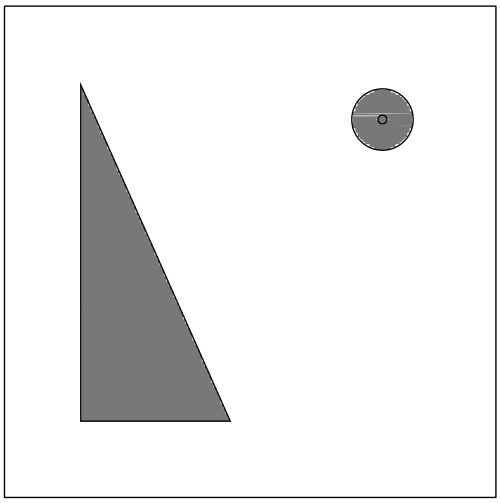
18. Train A leaves Birmingham New Street station at 1747 travelling due North on the slow line at 90 km/hour.

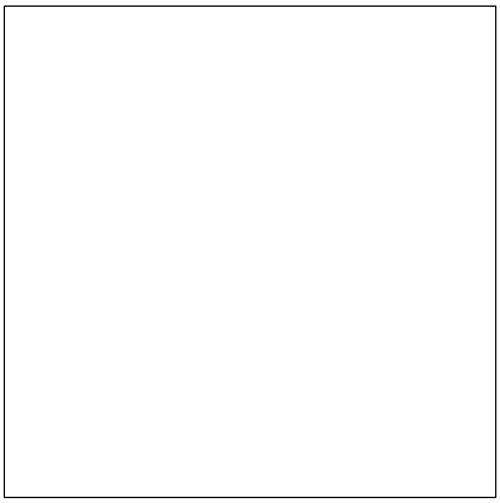
How many kilometres has this train travelled when the time is 1817? _____

Train B leaves Birmingham New Street station at 1817 also travelling due North but on the fast line. The speed of train B is 135 km/hour.

At what time does train B overtake train A? _____

19. The diagram below shows a piece of abstract art hanging up on Andrew's bedroom wall. To make this look even more interesting he decides to rotate this painting through 90 degrees clockwise. In the space provided show what the painting will look like in its new position.



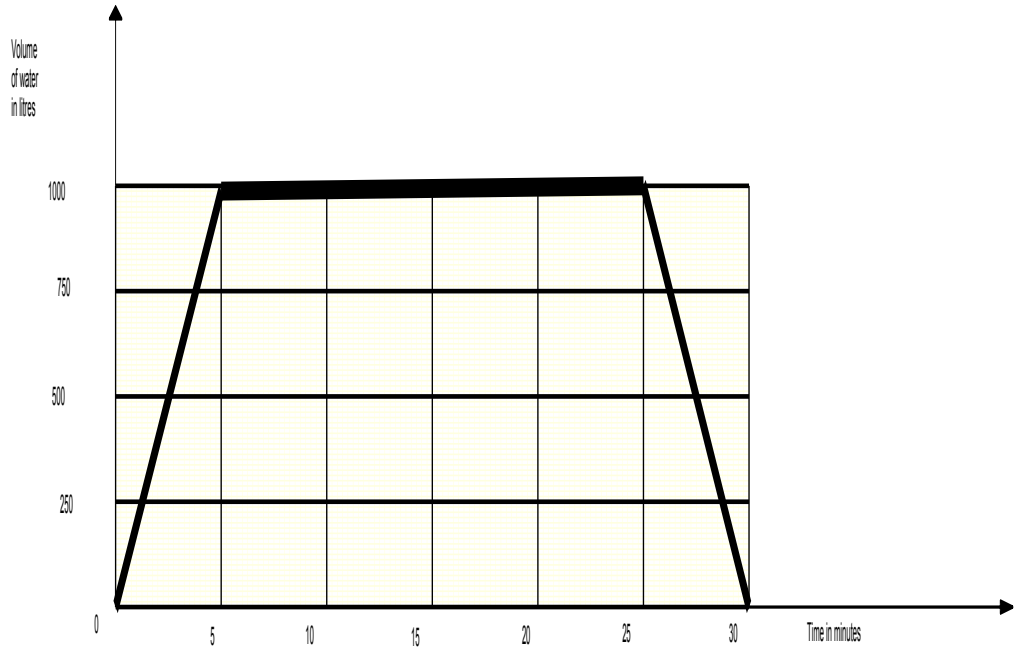


SPACE FOR WORKING

Answer

20. Every evening Diana has a bath. She turns on the taps and waits patiently for the bath to fill before she turns them off and steps in. At the end of her bath she steps out of the water before pulling out the plug to empty the bath.

A graph of the volume of water (measured in litres) plotted against time (measured in minutes) is shown below.



How long does she spend in the bath? _____

Work out the number of litres of water that flow into the bath **per minute** as the bath fills up. _____

Does the bath empty at a faster, slower or the same rate as it fills?

Faster, slower or same? _____

SPACE FOR WORKING



Answer

21. Amar (form captain), Brian (vice captain), Charles and Daniel are best friends in the same class at school. They always like to stand next to each other in the lunch queue.

On Mondays it is a school rule that the form captain is at the front of the queue followed by the vice captain. There are two ways in which these boys can queue up on a Monday: ABCD and ABDC.

On Tuesdays, the form captain must again queue up first but the remaining three boys can follow in any order. There are six ways in which these boys can queue up on a Tuesday. Four of these ways are listed below. Write down the remaining two: ABCD, ABDC, ACBD, ACDB, _____, _____

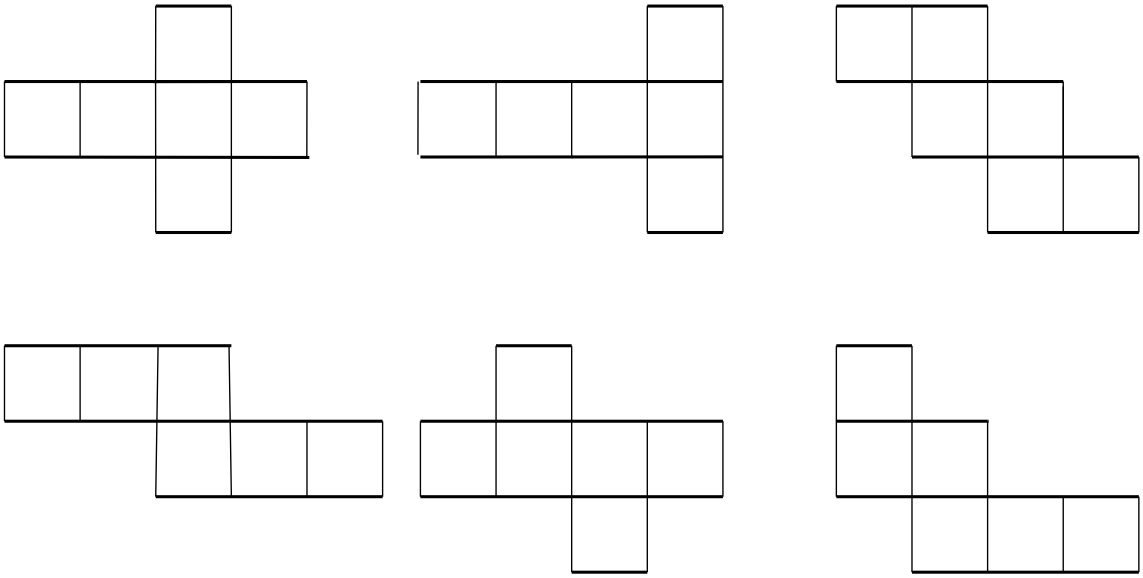
On Wednesdays there are no restrictions and all four boys can queue up together in any order. In how many ways can this be done? _____

22. Isolde enjoys making cubes. She first draws out shapes on pieces of cardboard and then folds them along the lines to form a cube.

The diagrams below show six attempts.

Unfortunately only five of these actually work.

Cross out the shape which is impossible.



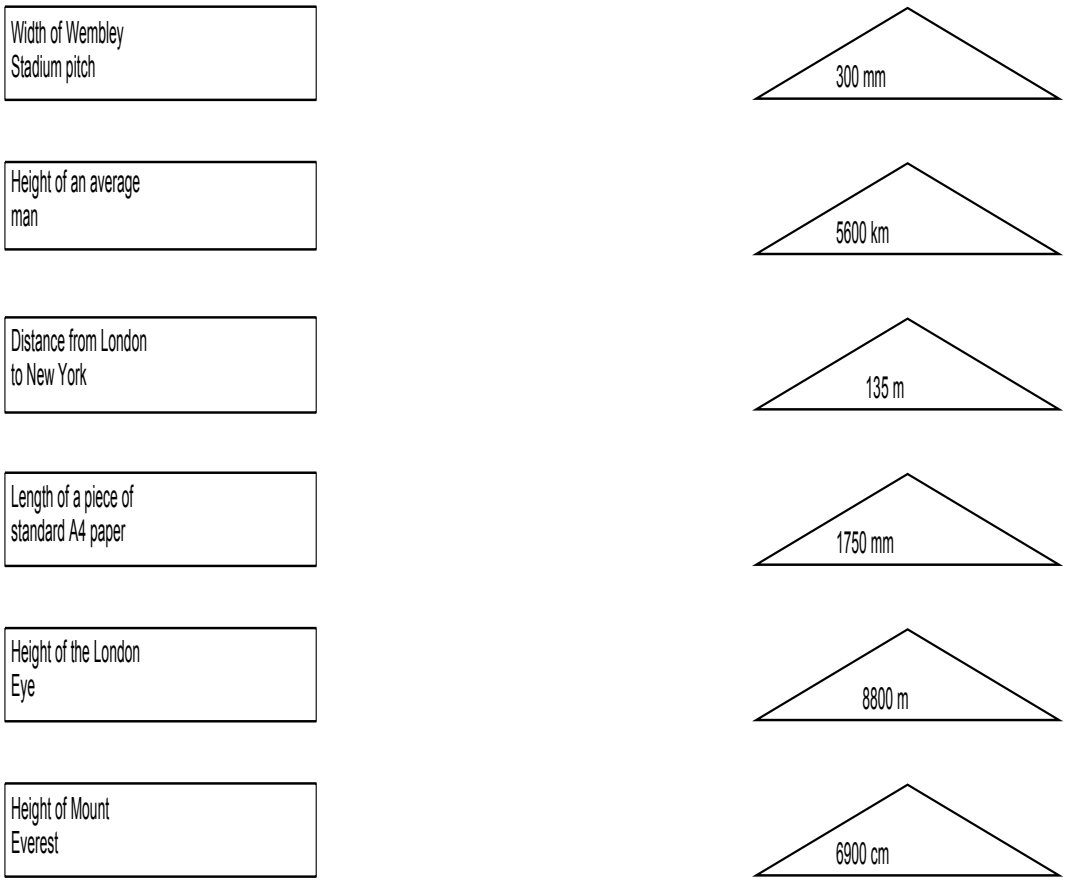
SPACE FOR WORKING

23. As part of a mathematics project a class is asked to look up the lengths of objects on the internet.

These objects are listed in the rectangles below and the measurements are given in the triangles.

Unfortunately these objects and measurements have been muddled up.

Draw lines on the diagram to match each object with its correct length.



SPACE FOR WORKING

Answer

24. In this question you may assume the following exchange rates:

1 British pound (£) = 1.5 American dollars (US$)
1 British pound (£) = 2 New Zealand dollars (NZ$)

The price of a hoodie in the London branch of Abergavenny and Filtch is £80. In New York the price is US$90. How much do I save by buying the hoodie in New York? Give your answer both in US dollars and pounds.

Saving = US$ _____ and £ _____

My friend Sheila lives in Auckland, New Zealand. She saves US$60 if she buys this hoodie in New York. How much does it cost in New Zealand? Give your answer in New Zealand dollars.

NZ$ _____

Work out the exchange rate for converting New Zealand dollars into American dollars:

1 New Zealand dollar (NZ$) = _____ American dollars (US$)

25. Seven children, A, B, C, D, E, F, G take part in a competition.

Use the information below to fill in the table:

Position	Child
1st	
2nd	
3rd	
4th	
5th	
6th	
7th	

- There are no tied positions
- D beat A
- C was the winner
- If you multiply the positions of A and D you get the position of F
- A and E are in next to each other in the table.
- B beat G

SPACE FOR WORKING

Answer

26. The average of a set of numbers is worked out by adding the numbers together and then dividing by the number of numbers.

Work out the average of:

1, 1, 1 _____

1, 1, 4 _____

1, 4, 7 _____

4, 7, 13 _____

Describe, in words, a simple pattern that you notice about these answers:

_____

Class 6A go on a Geography trip to Eastbourne and investigate the size of pebbles on the beach. Jonnie picks up seven small pebbles and measures their lengths in millimetres. The lengths of the first six pebbles are:

1, 1, 1, 4, 7, 13

Assuming that the pattern that you observed above continues to hold, work out the length of Jonnie's seventh pebble. _____

27. Tristan is given six bags of fruit.

Bag A contains 2 apples, 4 oranges and 3 pears.
Bag B contains 3 apples, 1 orange and 2 pears.
Bag C contains 4 apples, 5 oranges and 3 pears.
Bag D contains 4 apples, 6 oranges and 4 pears.
Bag E contains 6 apples, 4 oranges and 3 pears
Bag F contains 7 apples, 7 oranges and 7 pears.

He is allowed to choose one of these bags and then pick just one piece of fruit from that bag at random.

Which bag should he choose if he is to **maximise** his chance of picking an apple? _____

Which bag should he choose if he is to **minimise** his chance of picking a pear? _____

SPACE FOR WORKING

Answer

28. The diagram below shows a sequence of squares drawn on a grid.
The coordinates of the centre of square number 1 are (1,1).
The coordinates of the centre of square number 2 are (2,3).
The first number in the pair is the *x*-coordinate and the second number is the *y*-coordinate.

Write down the coordinates of the centre of

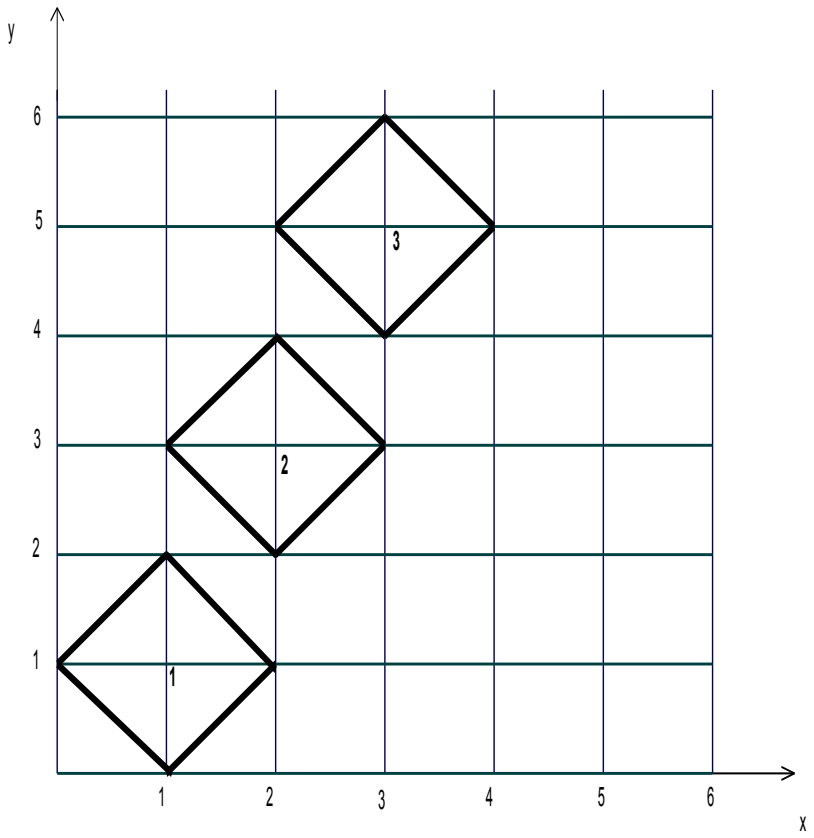
square number 3 _____

square number 4 _____

square number 10 _____

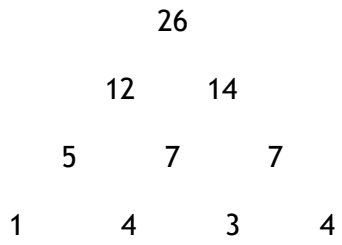
square number 234 _____

The *y*-coordinate of the centre of one of the squares in this sequence is 2177. Work out the *x*-coordinate of this square. _____

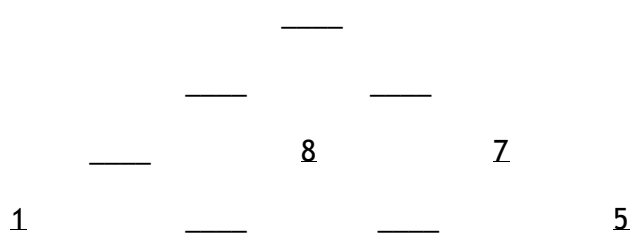


SPACE FOR WORKING

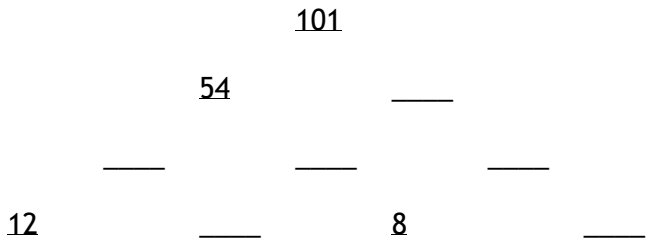
29. In the triangles shown below each number is the sum of the two numbers directly underneath it. For example, 26 = 12 + 14 and 5 = 1 + 4.



Complete the triangle of numbers:



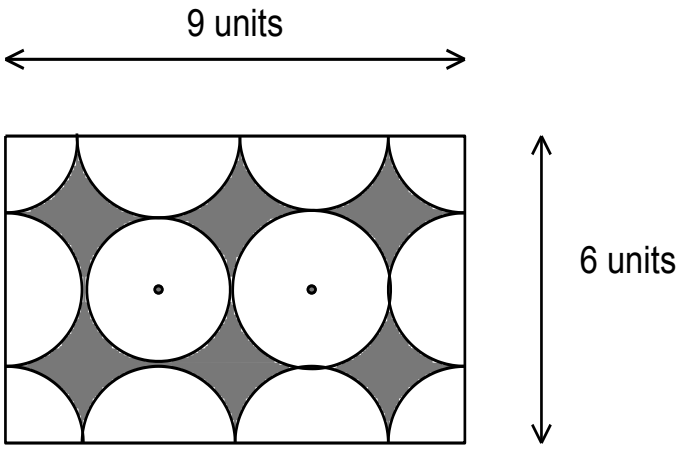
Complete the triangle of numbers:



SPACE FOR WORKING

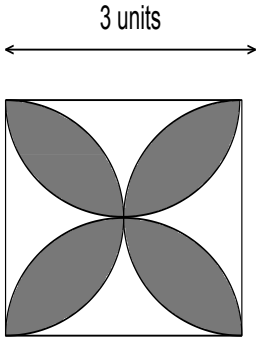
Answer

30. The diagram below shows a rectangle, 9 units long, 6 units wide and with parts of non-overlapping circles drawn all over it. The circles all have the same radius and the area of each is 7 square units.
Work out the shaded area.



Shaded area = _____ square units

The diagram below shows a square which is 3 units long with four identical semi-circles drawn on each edge. These semi-circles overlap to create four petals which are shaded on the diagram. The area of each semi-circle is 3.5 square units. Work out the shaded area.



Shaded area = _____ square units

SPACE FOR WORKING

GO BACK AND CHECK YOUR ANSWERS CAREFULLY