Sample Paper

11+

Maths

Entrance Examination

Bancroft's

11+ Entrance Examinations

Guidance Notes for Parents

<u>Mathematics</u>

Candidates will sit <u>one</u> paper, which lasts <u>75 minutes</u>. A ruler, pencil and protractor will be needed, but <u>not</u> a calculator.

The paper consists of about thirty-five to forty questions in increasing order of difficulty. Questions will cover numeracy, problem solving and shape and space, and should be broadly accessible to children who are working towards level 5 at Key Stage Two. Some of the later questions may include elements from level 6 and contain more difficult, non-standard problems. We try to make these problems original yet accessible to mathematically talented children. Children should complete as much of the paper as they can.

Preparation:

Children who are likely to cope comfortably with mathematics at Bancroft's should only need an experience of solving problems under timed conditions.

We find that excessive coaching for the paper can be counter-productive in the longer term. The questions are designed to test how the candidate copes with unfamiliar problems, and it is not intended that children should be taught any particular methods in preparation for this.

ENTRANCE AND SCHOLARSHIP EXAMINATION 2018

MATHEMATICS (1 hour 15 minutes)

SURNAME	
FIRST NAME(S)	
DATE OF BIRTH	
PRESENT SCHOOL	

INSTRUCTIONS

1. Answer as many questions as you can. If you get stuck, go on to the next question.
   YOU ARE NOT EXPECTED TO BE ABLE TO ANSWER ALL OF THEM.

2. SHOW ALL WORKING - you may get marks for working even if you don't give the right answer. Use the space beside each question.

3. Write each answer in the space provided. The number in brackets is the number of marks for each question.

4. **No calculators allowed.**

For Examiner's use only.

SECTION	A	D
MARKS		
	100	**40**

SECTION A

DO AS MUCH OF THIS SECTION AS YOU CAN.

IF YOU GET STUCK, GO ON TO THE NEXT QUESTION.

1. Fill in the missing numbers in the boxes.

$$2018 - \boxed{} = 1989$$

$$0.5 \div \tfrac{1}{2} = \boxed{}$$

$$18 + \boxed{} + 23 = 67$$

$$\boxed{} \times 5 \times 10 = 4500$$

$$\tfrac{3}{4} \text{ of } 36 = \boxed{}$$

Write in figures the number two million, two hundred and two

$$= \boxed{}$$

(6 marks)

2.   Subtract 2018 from 8102.

.... (2 marks)

3.   Divide $(2018 - 20 + 18)$ by 8.

.... (2 marks)

4.   Multiply 2018 by 17.

.... (2 marks)

5.   What number (written in digits) is twenty **less** than twenty

thousand?

.... (2 marks)

6. a) I thought of a number, halved it and then subtracted 9.

   I got an answer of 12.

   What was my original number?

   .... (2 marks)

   b) Fawzan went shopping with £100 in his wallet.

   He spent 10% of his money on a book and 20% of the rest on a

   DVD. How much money did he then have left?

   £..................... (2 marks)

   c) Abdul is making some small snacks for a party.

   He cuts 1.2 kg of cheese into a number of 30 g pieces.

   How many pieces does he have?

   ....pieces (2 marks)

7. a) The sum of three consecutive whole numbers is 60.

   What is the largest of the three numbers?

   .... (2 marks)

   b) What is the smallest positive whole number that divides exactly by

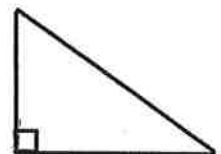   1, 2, 3, 4 and 5?

   .... (3 marks)

8. What is the name of the special quadrilateral that has 4 lines of symmetry

   (or 'mirror lines')?

   .... (2 marks)

9. A right angled triangle has an angle of 55°.

   What is the size of the smallest angle in the triangle?

   ....degrees (2 marks)

10. a)

$\dfrac{3}{4}$	$\dfrac{2}{3}$	$\dfrac{7}{10}$

For the three fractions in the table above, write down

    i)   the largest fraction   …………………….. (1 mark)

    ii)   the smallest fraction   …………………….. (1 mark)

b) Write (as a **decimal**) the difference between $\dfrac{3}{4}$ and $\dfrac{7}{10}$

………………….. (1 mark)

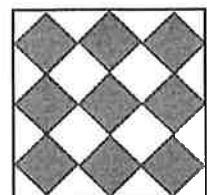11. a) My flask holds 480ml when it is one quarter empty.

    How much does it hold when it is one quarter full?

………………….ml (2 marks)

b) In the diagram, the small squares are all the same size.

    What fraction of the large square is shaded?

………………….. (2 marks)

12. a) I set off with a £10 note to buy a book costing £4.95, a cake costing

£1.30 and a new pen. I got £2.25 change. How much did the pen cost?

£..................... (2 marks)

b) Six children each had an equal share of a sum of money.

They each received £3.18 and there was 2p left over.

How much was the sum of money?

£..................... (2 marks)

c) Auntie Jean is saving all her 5p coins in a jar.

The total amount of money in the jar is £18.55.

How many coins are in the jar?

.....................coins (2 marks)

13. What is the missing number in each of these sequences?

   i)   6, 12, ..., 48, 96   Missing number = ... (1 mark)

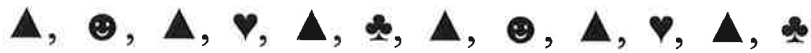   ii)   3, 13, 24, ..., 49, 63   Missing number = ... (2 marks)

14. I write down a sequence of numbers.

   My first number is 160 000 and then I divide by 4 to get the next number

   each time. What is the 5th number in my sequence?

                                          .... (3 marks)

15. A pattern that repeats every six symbols starts like this:

▲, ☻, ▲, ♥, ▲, ♣, ▲, ☻, ▲, ♥, ▲, ♣

i)   What is the 100ᵗʰ symbol in the sequence?

.... (2 marks)

ii)   What is the 107ᵗʰ symbol in the sequence?

.... (1 mark)

16.   Ben makes a stack of identical cans with 6 on the bottom row,

5 above that, then 4, then 3, then 2, then 1 on top.

Jamal makes a stack twice as high.

How many cans are there in Jamal's stack?

.... (3 marks)

17. a) Freya puts a casserole in the oven at 11.40am.

   It needs 1 hour and 45 minutes to cook.

   At what time will it be cooked?

   ………………….. (2 marks)

   b) How many minutes are there from 11.11 until 23.23 on the same day?

   …………….. minutes (2 marks)

   c) Archie is 20 years, 20 months, 20 weeks and 20 days old.

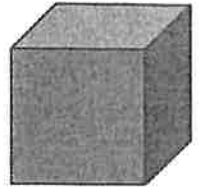   What age will he be on his next birthday?

   ……………. years old (2 marks)

   d) Gemma had a baby born on 1st February 2017.

   On what date will the baby be 400 days old?

   ………………….. (3 marks)

18. The faces of a cube are painted so that any two faces with an edge in common are painted different colours.

What is the smallest number of colours needed?

..............colours (2 marks)

19. A solid wooden cube is painted blue on the outside.

The cube is then cut into eight smaller cubes of equal size.

What is the total number of faces of the smaller cubes that have blue paint on them?
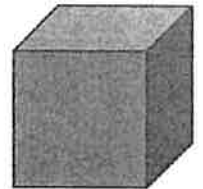
..............faces (2 marks)

20. Chi is facing North East.

In which direction will he be facing if he turns clockwise through 3 right angles?
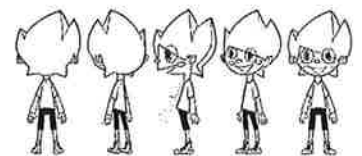
.... (2 marks)

21. a) A group of 30 adults and 16 children paid £408 in total to watch a

football match. Each child ticket cost £3.

What was the cost of each adult ticket?

£...................... (3 marks)

b) In a sale, prices are reduced by 15%.

What is the sale price of a hoody that originally cost £30?

£.................... (2 marks)

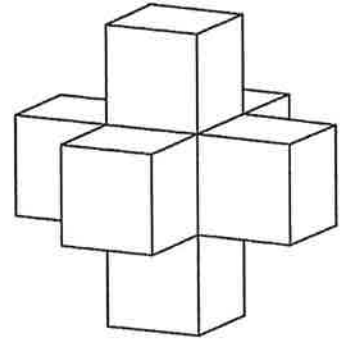c) Guy has twice as many stickers as Asif and five more than Kayal.

They have 35 stickers altogether.

How many stickers does Guy have?

.... (2 marks)

22. A cube has each of its faces covered by one face of an identical cube, making the solid shape shown.

    The volume of the solid shape is 875 cm³.
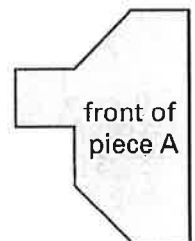
    a) What is the volume of one of the cubes?

    ....cm³ (2 marks)

    b) What is the length of one side of a cube?

    ....cm (2 marks)

23. The card is **grey** on the front and **black** on the back.

    When piece A is turned over, which one of the shapes below shows its **black** side?
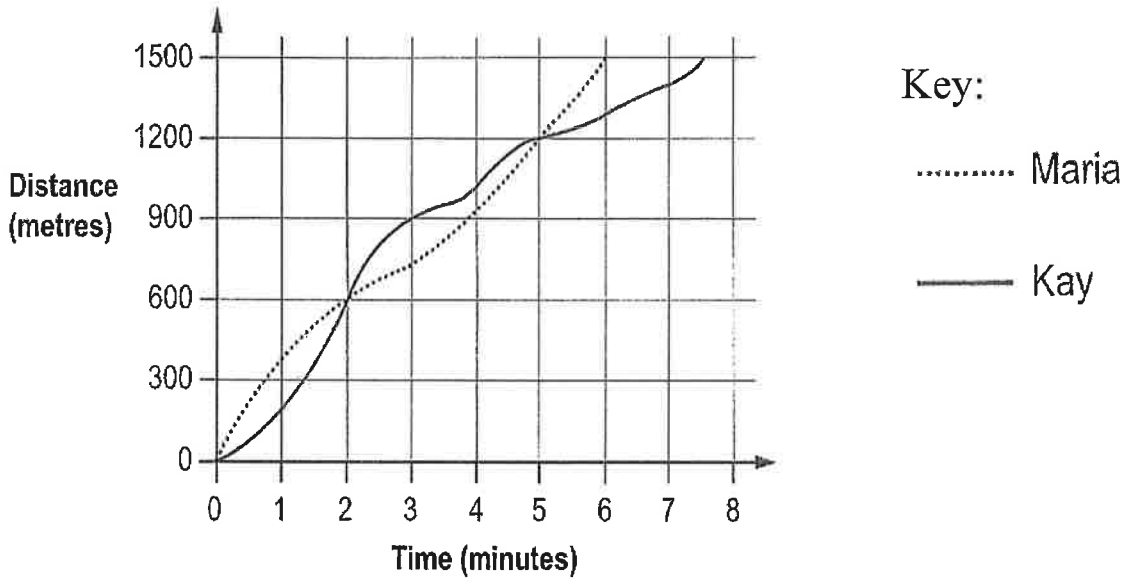
    Put a ring around the correct answer.

    front of
    piece A

    (2 marks)

24. Maria and Kay ran a 1500 metres race.

The graph shows information about the race.

i) For how many minutes was Kay in the lead??

...................minutes (1 mark)

ii) After how many metres were they level during the race?

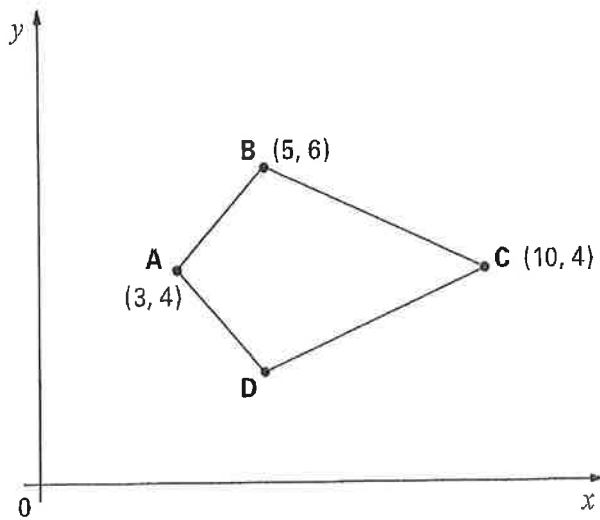......... metres and ....metres (1 mark)

iii) Who won the race?

.... (1 mark)

25. The diagram shows the coordinates of three points A, B and C.

Shape ABCD is a kite.

What are the coordinates of point D?

(……. , …….)   (1 mark)

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26. Given that ▲ + ▲ = ■

and ■ + ▲ = ●

and ◆ = ● + ■ + ▲

how many ▲s are equal to ◆ ?

…………… (3 marks)

27. 5 toffees weigh the same as 6 maltesers and 3 toffees.

How many maltesers would weigh the same as 9 toffees?

......................maltesers (3 marks)

28. In a game you need to get three coloured discs (green, blue and red) in the correct order.

Three attempts have been made and are shown below, with the number of discs that are in the correct positions.

What is the correct order for the three coloured discs?

POSITION 1	POSITION 2	POSITION 3	NUMBER CORRECT
Red	Blue	Green	One
Red	Green	Blue	None
Green	Blue	Red	None

Position 1 ...., Position 2 ...., Position 3 .... (3 marks)

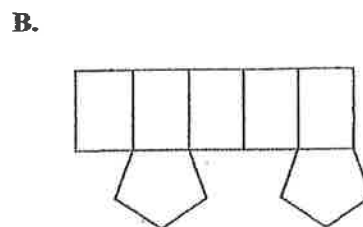29. Given that **44 × 382 = 16808**, *use this information* to work these out:

i) 16808 ÷ 382 .... (1 mark)

ii) 88 × 191 .... (1 mark)

iii) 1680.8 ÷ 44 .... (1 mark)

30. The diagram shows a pentagonal prism.

Write the letter of the one shape below

that is a net for the pentagonal prism.

A.

B.

C.

D.

E.
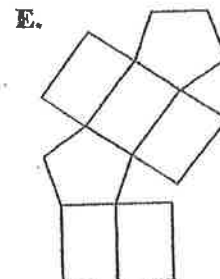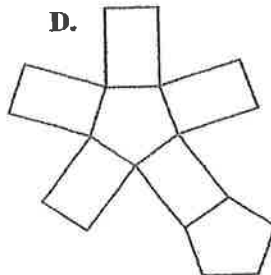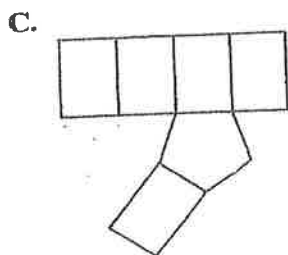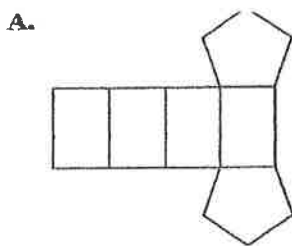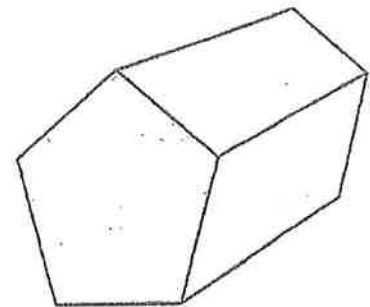
.... (2 marks)

YOU HAVE NOW FINISHED SECTION A.

NOTE: THERE ARE **NO** SECTIONS B OR C.

THE NEXT SECTION IS SECTION D.

SECTION D

DO NOT START THIS SECTION UNTIL YOU HAVE DONE AS MUCH AS YOU CAN IN SECTION A.

YOU ARE NOT EXPECTED TO BE ABLE TO DO ALL OF THESE QUESTIONS.

IF YOU CANNOT ANSWER A PARTICULAR QUESTION TRY THE NEXT ONE.
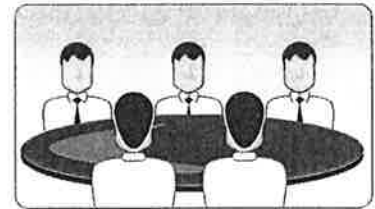
DO AS MANY QUESTIONS AS YOU CAN.

1. Dave has a lot of tables.

    Each rectangular table seats 8 people.

    Each round table seats 5 people.

    What is the smallest number of tables of each type that Dave needs to use

    to seat 35 friends and himself, without any empty seats?

    ....rectangular tables

    ....round tables

    (3 marks)

2. a) Which one of the following numbers is three **less** than a multiple of 5

and three **more** than a multiple of 6?

A. 12   B. 17   C. 21   D. 22   E 27

.... (2 marks)

b) What is the smallest four-digit positive whole number which has four different

digits?

.... (2 marks)

c) How many **odd** three-digit numbers is it possible to make, using just the

numbers 7, 8 and 9?

(You are allowed to use each of the numbers more than once in a particular

three-digit number.)

.... (3 marks)

3. a) Fill in each box with either + or - to make the answer of 100.

$$123 \ \boxed{} \ 45 \ \boxed{} \ 67 \ \boxed{} \ 89 \ = \ 100$$

(3 marks)

b) Last year, 275 of the 500 pupils at Woodgreen School were boys.

This year, there are 540 pupils in the school but the proportion of boys is

the same as last year.

How many boys are at the school this year?

.................boys (4 marks)

c) Maya cuts a 6 metre piece of string into three different pieces.
   The longest piece is 40 cm longer than the middle piece.
   The middle piece is 70 cm longer than the shorter piece.
   How long (in centimetres) is the **longest** piece?

.................cm (4 marks)

4. The symbol * is used like this:

$$a * b = 5 \text{ times } a, \text{ plus } b.$$

For example, $2 * 7 = (5 \times 2) + 7$
$$= 17.$$

i) Find the value of $9 * 8$

.... (1 mark)

ii) What number does m stand for, if $m * 6 = 41$?

$m =$ .... (1 mark)

iii) If $n * 4 = 8 * n$, what number does n stand for?

$n =$ .... (2 marks)

5. Rob, Bertie and Dom ran a race.

Just one of the following four statements is true.

Which one is it?

A. Rob came 1st.
B. Bertie came 1st.
C. Dom came 2nd.
D. Dom did not come 2nd.

.... (2 marks)

6. a) Write down the answers to the calculations. (*Hint*: there is a quick way!)
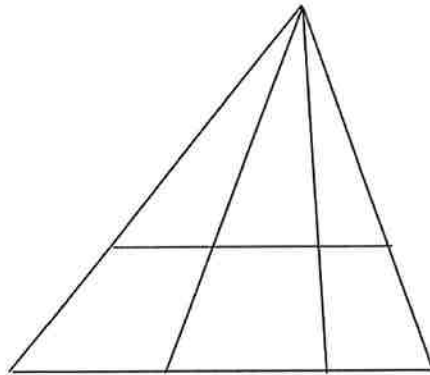
    i) $(49 \times 37018) + (51 \times 37018)$

                                                   .... (2 marks)

    ii) $(26 \times 37018) - (25 \times 37018)$

                                                   .... (2 marks)

    b) How many triangles are there in this diagram?

                                                   .... (3 marks)

7. Given that none of A, B or C is zero, work out what number each of the letters stands for in these two calculations.

```
    B C
×   B C
  A B C
```

A = ……………... (1 mark)

B = ……….……. (1 mark)

C = …………….. (1 mark)

```
    D E F
    D E F
+   D E F
    E E E
```

D = …………….. (1 mark)

E = ………..……. (1 mark)

F = …………..…. (1 mark)

STOP! Now go back and check your work!