BANCROFT'S SCHOOL
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MATHEMATICS

SAMPLE PAPER

11+ ENTRANCE EXAMINATION

BANCROFT'S SCHOOL
11+ ENTRANCE EXAMINATIONS
GUIDANCE NOTES FOR PARENTS

MATHEMATICS

Candidates will sit one paper, which is in two sections and lasts 75 minutes. A ruler, pencil and protractor will be needed, but not a calculator.

Section A:

Consists of about thirty 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.

Section D:

Contains more difficult, non-standard problems. We try to make these problems original yet accessible to mathematically talented children. Children should not attempt these questions until they have completed as much as they can in Section A. A high score in this section is not expected, but we will use the Section D score as additional evidence when we are identifying Scholarship candidates or as supplementary evidence for borderline candidates.

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. Section D 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.

BANCROFT'S SCHOOL

ENTRANCE AND SCHOLARSHIP EXAMINATION 2016

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.

$88 + \square = 173$

$(17 \times 2) - (27 \times 0) = \square$

$1.25 - \square = 0.75$

$\square \times 0.25 = 1$

$64 \div 8 = 32 \div \square$

$(3 \times 2 \times 1) - (3 + 2 + 1) = \square$

(6 marks)

2. Add together 369 and 2468.

..... (2 marks)

3. Subtract 364 from 2046.

..... (2 marks)

4. Multiply 193 by 72.

..... (2 marks)

5. Divide 60600 by 8.

..... (2 marks)

6. a) A crate holds 8 cartons of milk.

How many crates are needed to hold 349 cartons?



.....crates (2 marks)

b) Seven adult cinema tickets cost £24.50.

How much will four adult tickets cost?



£..... (2 marks)

c) Flora is exactly eleven and a half years old.

How many months old is she?



.....months (2 marks)

7. My four pet monkeys collected a pile of 60 peanuts.



Monkey A woke in the night and ate half of them,

then Monkey B woke and ate one third of what was left,

then Monkey C woke and ate one quarter of the rest

and finally Monkey D woke and ate one fifth of what remained.

i) How many peanuts did Monkey D eat?

..... peanuts (2 marks)

ii) How many peanuts were left in the morning?

..... peanuts (2 marks)

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8. Last week George spent 12 hours playing on his Xbox.

He spent the same length of time on it each weekday and twice as long on it each day at the weekend.

How long (in hours and minutes) did he spend on his Xbox on Saturday?

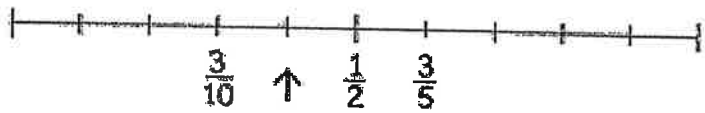
.....hours .....minutes (3 marks)

9. a) Write down the decimal number that the arrow is pointing to:



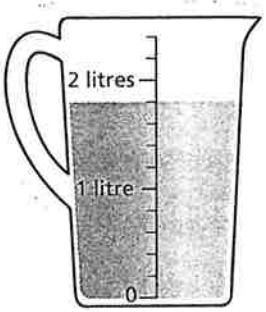
..... (1 mark)

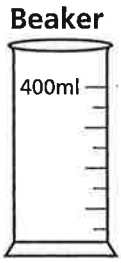
b) Write down (in simplest form) the fraction that the arrow is pointing to:



..... (2 marks)

c) i) The jug contains water up to the level shown in the diagram. How many millilitres (ml) of water are in the jug?





.....ml (1 mark)

ii) Chan now empties the jug of water by pouring equal amounts into six identical empty beakers. One of the beakers is shown in the diagram. Draw a line on the beaker to indicate the level of water in it.

(2 marks)

10. i) Write the following decimal numbers in order from smallest to largest:

7.044	7.07	7.41	7.4004

....., ..., ..., ... (2 marks)

ii) Calculate the difference between the largest and smallest of these four decimals.

..... (2 marks)

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11. a) 20% of a number is 3.2. What is the number?

..... (2 marks)

b) Calculate the value of $135 \div (1 + 3 + 5)$

..... (2 marks)

c) Hasan correctly worked out that $3 \times 31 \times 73 = 6789$.

What is the value of $6789 \div 31$?

..... (2 marks)

12. 40% of the children on a school trip are boys and there are 72 girls.

How many children are on the trip?



..... children (2 marks)

13. *In this question, give your answers as fractions* ***in their simplest form.***

Raj has a bag that contains 8 blue and 12 red marbles only.

i) What fraction of the marbles in the bag are blue?

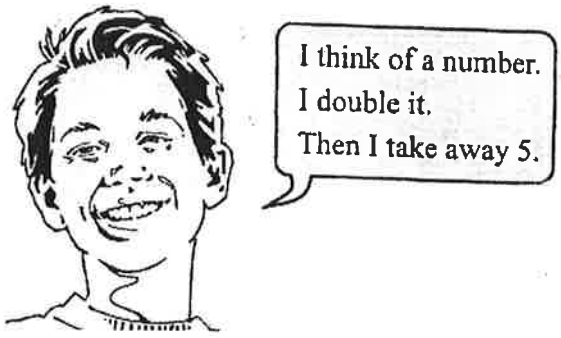
..... (1 mark)

ii) Raj takes 2 blue marbles out of the bag.

Now what fraction of the marbles in the bag are blue?

..... (2 marks)

14. Here is Luke.



i) If Luke starts with 3.7, what answer will he get?

..... (1 mark)

ii) What number should Luke start with to get an answer of 24?

..... (2 marks)

15. Fill in the missing digits in each of these calculations:

a)
$$\begin{array}{r} 1\ 5\ \square\ 9 \\ +\ \square\ 7\ \square \\ \hline 2\ 3\ 5\ 3 \end{array}$$

(2 marks)

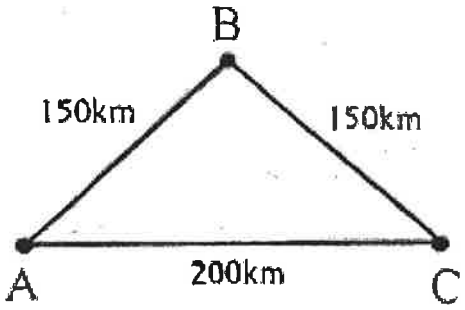
b)
$$\begin{array}{r} \square\ 6\ 3 \\ \times\ \quad \square \\ \hline 3\ 9\ \square\ 1 \end{array}$$

(2 marks)

16. Rio travels directly from A to C at a speed of 80 km/hr.

Harry travels from A to B to C at 100 km/hr.

Fahad travels directly from A to C at 60 km/hr.



i) How long (in hours and minutes) does each person take?

Rio takes .....hours .....minutes (1 mark)

Harry takes .....hours .....minutes (1 mark)

Fahad takes .....hours .....minutes (1 mark)

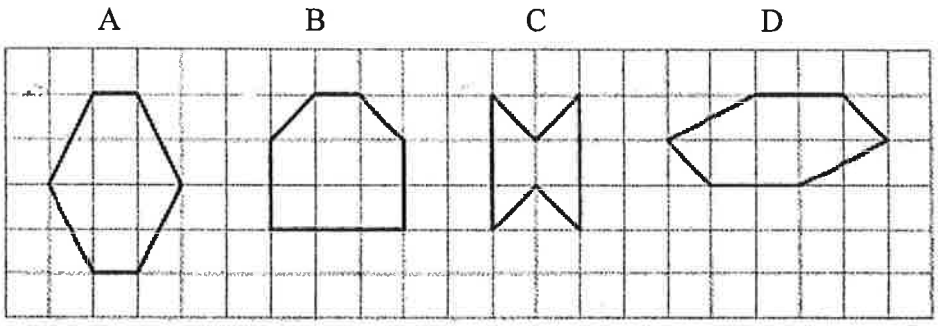
ii) If they all set off at the same time, who arrives first?

..... (1 mark)

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17. Here are four hexagons (A, B, C, D) drawn on squared paper.

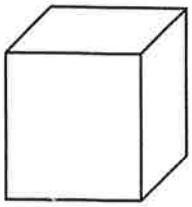
Write down the number of lines of symmetry for each hexagon.



A ..... B ..... C ..... D .....

(2 marks)

18. The total surface area of a cube is 96 cm^2.



i) What is the area of one face of the cube?

.....cm^2 (2 marks)

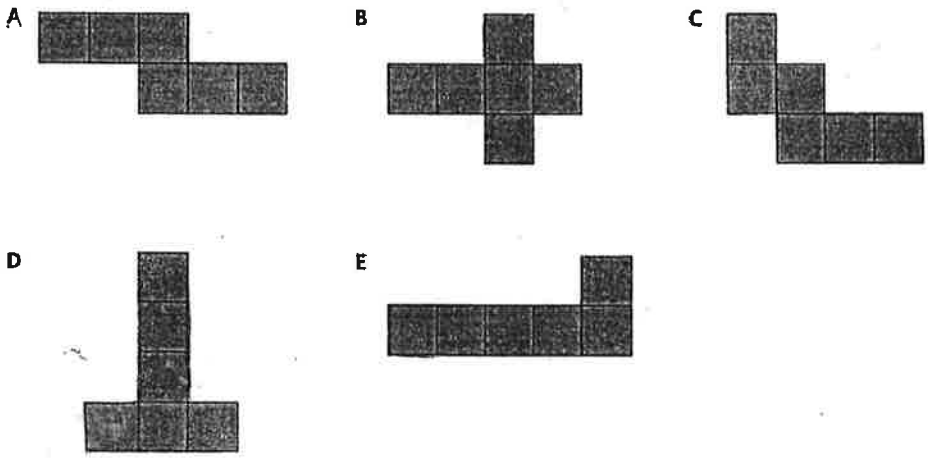
ii) What is the length of one edge of the cube?

.....cm (2 marks)

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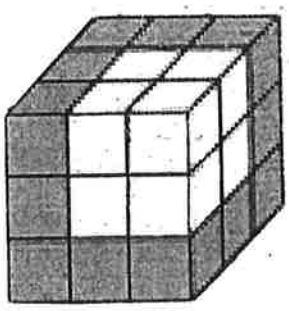
19. Only three of the nets shown below can be used to make a cube.

Write the letters (A, B, C, D, E) of the nets which do NOT make a cube.



..... and ..... (2 marks)

20. Sam is given 27 identical white cubes.



He is told to paint some of the faces grey and then stack the cubes so that they appear as shown.

How many of the cubes definitely have some grey paint on them?

..... (2 marks)

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21. a) Yusuf has 6 equilateral triangles, each with a perimeter of 12cm.

He fits them together to make a regular hexagon.

What is the hexagon's perimeter?

.....cm (2 marks)

b) Shreya has 4 equilateral triangles, each with a perimeter of 12cm.

She fits them together to make a larger equilateral triangle.

What is the perimeter of the larger equilateral triangle?

.....cm (2 marks)

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22. A litre of water weighs 1 kg and a litre of ice weighs 900g.

How many more grams will 6 litres of water weigh compared to 5 litres of ice?



.....g (2 marks)

23. 20 people were asked to choose a drink.

One quarter chose tea.

Seven people chose coffee.

30% of them chose cola.

The rest chose water.

i) How many people chose water?

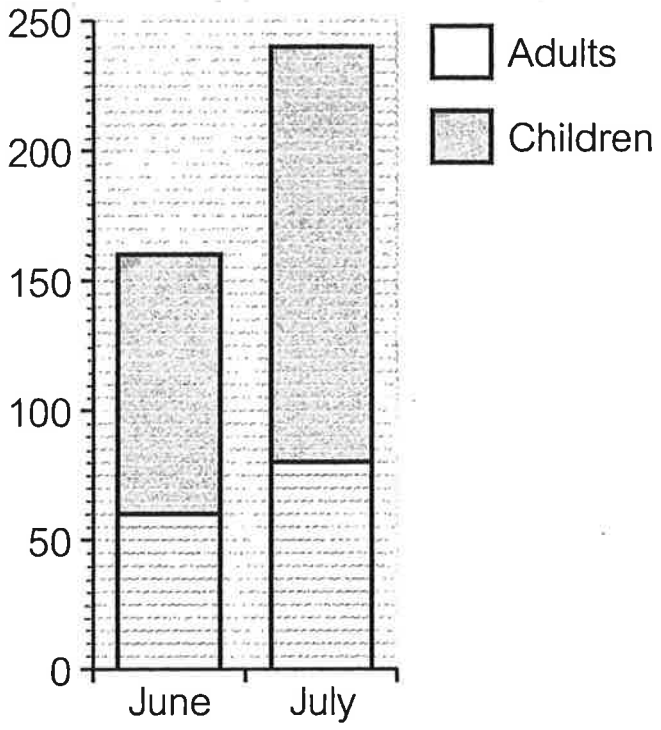
.....people (2 marks)

ii) Maya drew a pie chart to show all their choices.

How many degrees should 'Water' have on her pie chart?

.....degrees (2 marks)

24. The bar chart shows the number of patients (adults and children) seen by Dr Patel in June and July.



i) How many patients did Dr Patel see in June?

.....patients (1 mark)

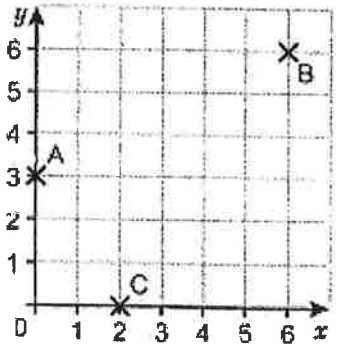
ii) How many children did Dr Patel see in July?

.....children (1 mark)

iii) What fraction of the patients seen by Dr Patel in July were children?

..... (1 mark)

25. i) Write down the coordinates of point A.



(..... , ...) (1 mark)

ii) Draw a line from B to C and write down the coordinates of the midpoint of the line.

(..... , ...) (1 mark)

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26. Here are four cards.

5	6	1	3

i) Choose two cards to make a two-digit multiple of 6.

..... (2 marks)

ii) Choose two cards to make a two-digit factor of 60.

.....(2 marks)

27. Jada picks one of these cards at random.



Here are some possible outcomes:

A The number on the card will be a factor of 24.

B The number on the card will be a multiple of 2.

C The number on the card will be a multiple of 3.

D The number on the card will be a multiple of 5.

E The number on the card will be a square number.

i) Which of these outcomes (A, B, C, D, E) is most likely to happen?

..... (1 mark)

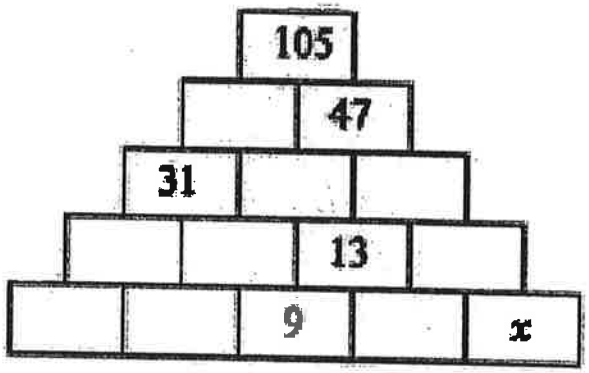
ii) Which of these outcomes is least likely to happen?

..... (1 mark)

iii) Which two of these outcomes are equally likely to happen?

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

28. In this partly completed pyramid, each rectangle is to be filled with the sum of the numbers in the two rectangles just below it.



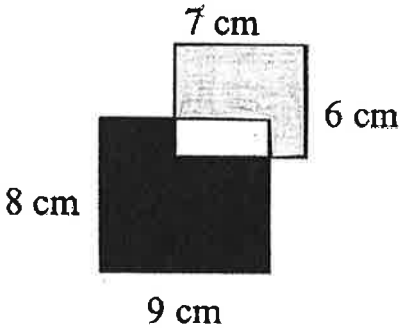
What number should replace x ?

..... (3 marks)

29. A rectangle measuring 7 cm by 6 cm overlaps a rectangle measuring 9 cm by 8 cm as shown in the diagram.

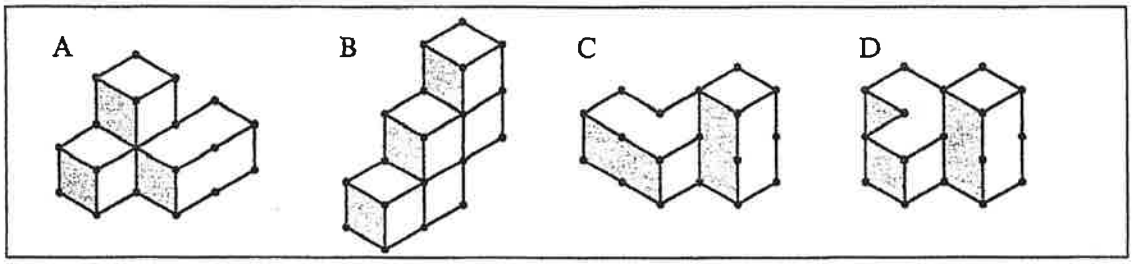
The region shaded grey has an area of 32 cm^2.

What is the area of the black region?

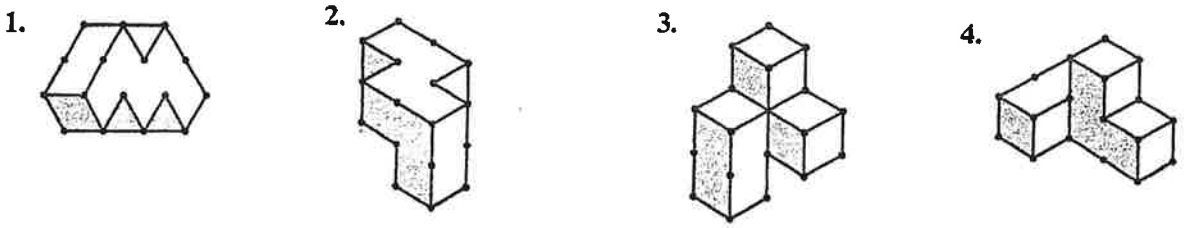


.....cm^2 (3 marks)

30. Erin builds the four 3-D models A, B, C and D shown below.



She turns each model around into positions 1, 2, 3 and 4 shown below.



Match each model A, B, C, D with its new position 1, 2, 3, 4.

A → ....., B → ....., C →....., D → .....

(3 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.

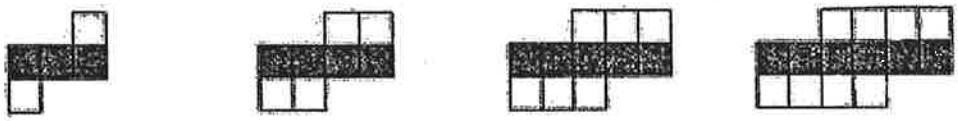
IF YOU CANNOT ANSWER A PARTICULAR QUESTION TRY THE NEXT ONE.

DO AS MANY QUESTIONS AS YOU CAN.

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1. Here is a sequence of shapes made with grey and white tiles.

Shape number 1 Shape number 2 Shape number 3 Shape number 4



i) How many grey tiles will there be in Shape Number 20?

..... (1 mark)

ii) How many white tiles will there be in Shape Number 36?

..... (1 mark)

iii) How many tiles will there be altogether in Shape Number 25?

..... (1 mark)

iv) Fill in the missing numbers in this sentence:

To find the total number of tiles,

you can multiply the Shape Number by ....., then add .....

(2 marks)

2. a) The difference between $\frac{1}{3}$ of a certain number and $\frac{1}{4}$ of the same number is 3.

What is the number?

..... (3 marks)

b) 383 and 6226 are examples of palindromic numbers as they read the same when the order of their digits is reversed.

Write down the largest five-digit palindromic number that is a multiple of 5.

..... (3 marks)

c) The order of the digits is reversed in a certain two-digit whole number.

This gives a new whole number which is one less than half of the original number. What is the original number?

..... (3 marks)

3. Each of the following statements is false!



In each statement, at least one zero has been missed out.

Adapt each statement by inserting the smallest possible number of zeros to make it true.

i) 52 + 41 = 543

..... + ... = ...

(1 mark)

ii) 163 + 71 = 1764

..... + ... = ...

(1 mark)

iii) 126 + 234 = 144

..... + ... = ...

(1 mark)

iv) 1 − 499 = 51

..... − ..... = ...

(1 mark)

v) 32 − 114 = 1898

..... − ..... = ...

(1 mark)

4. Every digit of a certain positive whole number is either a 3 or a 4, with each occurring at least once.

   The number divides exactly by both 3 and 4.

   What is the smallest number it could be?

..... (4 marks)

5. Hareni has twice as many sweets as Dora. After eating 18 sweets each, she has five times as many as Dora. How many sweets did Hareni start with?

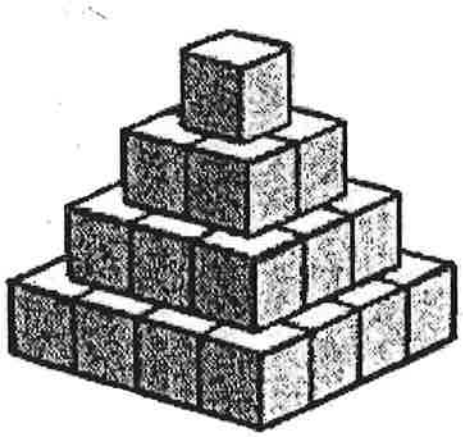
.....sweets (3 marks)

6. a) Aidan has a lot of sugar cubes which he finds he can build into one larger cube or spread out to make a square one layer high.

What is the smallest number of sugar cubes that Aidan could have?

..... (3 marks)

b) The diagram shows a pyramid made up of 30 cubes, each of which measures 1 cm by 1 cm by 1 cm.



What is the total surface area of the whole pyramid (including its base)?

.....cm^2 (4 marks)

7. a) Three cereal bars, two apples and one tube of mints cost £3.14.

Two cereal bars, three apples and four tubes of mints cost £4.21.

What is the total cost of buying one cereal bar, one apple and one tube of mints?

£..... (3 marks)

b) Each letter stands for a different number.

The totals for each row and column are shown.

A	B	C	D	22
C	B	A	D	22
D	B	A	D	25
C	C	C	D	17
23	11	26	26	

What is the value of each letter?

A = ...

B = ...

C = ...

D = ...

(4 marks)

STOP! Now go back and CHECK your work.