11+ Entrance Examination

MATHEMATICS PAPER

Time allowed: 1 hour

Calculators are *not* allowed

Write your number in the box below:

CANDIDATE NUMBER

_____

- There are **two sections** to this paper.

- Section A: Multiple choice questions. For each question use pencil to put a circle around the correct answer. If you make a mistake, rub it out and circle the correct answer. You should spend no more than 25 minutes on this section.

- Section B: The second section contains questions where you may need to show your methods and your working out. The last question is a puzzle-type question. If you finish this section, you may go back to the earlier section if you need to.

Results:

Section A	/ 25
Section B	/ 50

Section A

You may use rough paper for working out but this will not be marked. Only the answers you circle will be marked.

For each question, circle the correct answer in pencil.

1.

5000 + ? + 7 = 5087

    A   870   B   80   C   87   D   807

2.

3·094 + 0·06 = ?

    A   3·154   B   3·694   C   3·10   D   3·09406

3.

3·7 x 9 = 33·3   Write down the value of   3·7 x 90

    A   333   B   3·33   C   33·3   D   93·7

4.

2 + (3 x 6 + 4) ÷ 2 = ?

    A   17   B   13   C   none of these   D   12

5.

Decrease £44 by 10%

    A   £39·60   B   £4·40   C   £48·40   D   £34

6.

If   p – 9 = 12,   what number does p stand for?

    A   6   B   18   C   21   D   3

7.

I think of a number, double it and add 5. If I think of 21, what is my answer?

    A   8   B   16   C   52   D   47

8.

The next two numbers in the pattern   1, 1, 2, 3, 5, are…

    A   7 & 11   B   8 & 12   C   8 & 13   D   3 & 2

9.

q is a whole number. Can q^2 ever be the same as $4q$?

    A   can't tell   B   always   C   sometimes   D   never

10.

w is a number. Can $3w$ ever be less than w?

    A   no, never   B   yes, if w is negative   C   can't tell   D   yes, always

11.

How many lines of symmetry has a square?
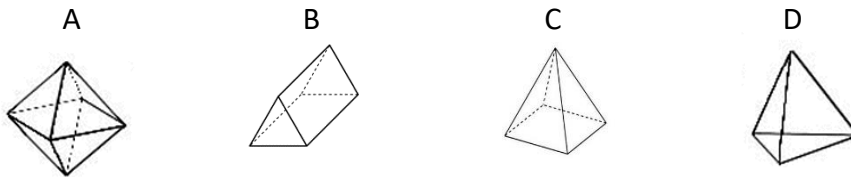
    A   1   B   2   C   4   D   8

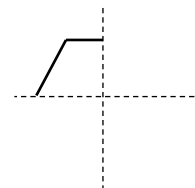**12.**

How many faces has a cuboid?

    A   4   B   6   C   8   D   12

13.

Three of these shapes have an even number of vertices. Which one does not?

    A   B   C   D

14.

The diagram shows part of a regular shape along with its two

lines of symmetry. The whole shape is:

    A   a trapezium   B   a rhombus   C   an octagon   D   a hexagon

15.

How many possible isosceles triangles are there containing an angle of 90°?

    A   none   B   1   C   2   D   more than 2

16.

Which set of numbers have a total of 14 and a range of 3?

    A   3, 5, 6   B   4, 4, 6   C   4, 4, 7   D   4, 5, 6

17.

A bag contains 3 red and 6 green marbles. If you pick out a marble at random, what is the chance that it will be red?

    A $\dfrac{1}{3}$ B $\dfrac{1}{2}$ C $\dfrac{1}{9}$ D $\dfrac{2}{3}$

18.

Two wodgets make a finkle. Five finkles make a splot. Three splots make a tink. How many wodgets make four tinks?

    A   30   B   120   C   60   D   14

19.

4 girls have an average height of 1·4m. A fifth girl of height 1·2m joins them. What is the average height of all five girls?

    A   2·6m   B   1·3m   C   none of these D   1·36m

20.

Issy tosses a **fair coin** four times. She gets Heads, Heads, Heads, Tails. If she tosses it a fifth time, is she *more likely* to get Heads or Tails?

    A   equally likely B   Heads   C   Tails   D   not enough information

21.

In the calculation 4 * 3 * 2 * 1 each * must be replaced by either a + or a × sign. Maggie wants to get an answer of 9. In what order should she replace the signs?

    A + × +   B   + + ×   C   × × +   D   × + ×
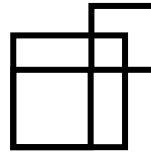
22.

Which of shapes A, B, C and D is most similar to shapes 1 and 2?

23.

How many squares are in this picture?

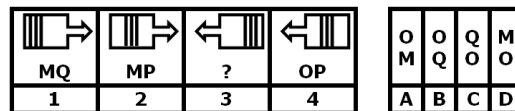A 2   B 3   C 4   D 5

24.

Work out the codes for pictures 1, 2 and 4 and then decide which of boxes A, B, C or D has the correct code for picture 3.

MQ	MP	?	OP		O M	O Q	Q O	M O
1	2	3	4		A	B	C	D

25.

Putting these lines $||$ round a number or calculation makes sure the answer is positive; for example both $|8|$ and $|-8|$ would give the answer 8. What is the answer to:

$10 - |4 - 20|$?

A 4   B 26   C −6   D 6

Section B

Answer in the spaces provided.

1. How much more than 523 is 872?

2. What is the largest number that can be written using the digits 5, 1, 8 and 2?

3. Work out   378 – 529 + 108

4. Work out   323 - 151

5. Work out   74 x 8

6. Work out   1638 ÷ 7

7. Find 40 % of £620

8. Circle the largest fraction

$^2/_3$ $^3/_4$ $^3/_5$ $^5/_6$

9. Divide   31500 by 30

10. In arithmetic questions, any calculations inside brackets are carried out first.

Put brackets in to make this calculation correct:

$$3 + 5 \times 2 + 3 = 40$$

11. Fill in the missing numbers.

In each part, you can use the first line to help you.

a)   16 × 15 = 240

16 × ☐ = 480

b)   46 × 44 = 2024

46 × 22 = ☐

c)   600 ÷ 24 = 25

600 ÷ ☐ = 50

12. When the wind blows it feels colder.

The stronger the wind blows, the colder it feels.

Fill in the gaps in the table.

The first row is done for you.

Wind strength	Temperature out of the wind (°C)	How much **colder** it feels in the wind (°C)	Temperature it feels in the wind (°C)
Moderate breeze	5	7 degrees colder	−2
Fresh breeze	−8	11 degrees colder	.....
Strong breeze	−4	..... degrees colder	−20
Gale	.....	23 degrees colder	−45

13. A box contains bags of crisps.

Each bag of crisps weighs 25 grams.

Altogether, the bags of crisps inside weigh 1 kg.

How many bags of crisps are inside the box?

14. A tin of paint can cover 45m^2 of wall. The school hall has 652 m^2 of wall to paint.

How many tins of paint are needed?

15. A man travels 200 miles at an average speed of 60 miles per hour.
How long does the journey take in hours and minutes?

16.
a) When x = 8, what is the value of 5x?

b) When x = 8, what is the value of 3x - x?

c) When x = 8, what is the value of x^2?

17. I put square tiles on a large grid so that the tiles touch at the corners.
The diagram shows part of my diagonal pattern.
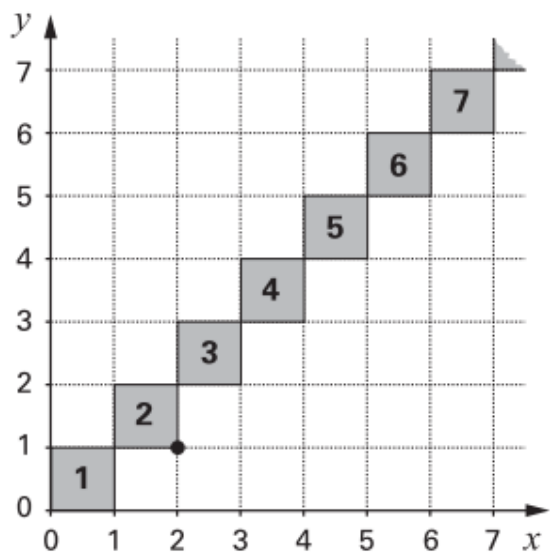
a) The **bottom right-hand** corner of **tile 2** is marked with a ●
Write the coordinates of this point.

(,)

b) **Tile 4** touches two other tiles.
Write the coordinates of the points where tile 4 touches two other tiles.

(,)   (,)

c) Write the coordinates of the points where **tile 17** touches two other tiles.

(,)   (,)

d) I have **30 tiles** to make a pattern on a grid.
   The pattern is a series of squares.
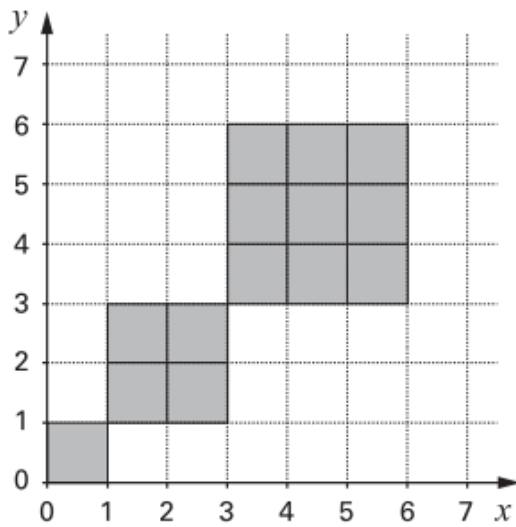
I have used some of the 30 tiles to make my pattern.
Do I have enough tiles to make the **next square**, of side length 4?
Show working to explain your answer.

18.

   a)   The **perimeter** of a regular hexagon is **42a + 18**
         Write an expression for the lengths of one of its sides.
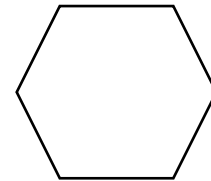
   b)   The **perimeter** of a different regular polygon is **75b – 20**
         The length of one of its sides is **15b – 4**
         How many sides does the regular polygon have?

19. Here is a triangular prism.

Write down the number of:

    a) Faces   …………….

    b) Edges   …………….

    c) Vertices   …………….
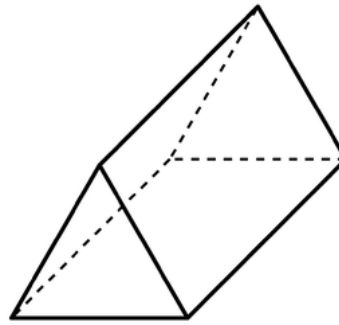
20. Here is a design for a kitchen tile.
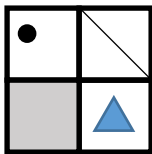
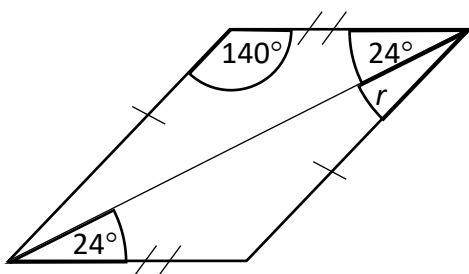Show what it would look like when turned through 90° anticlockwise.
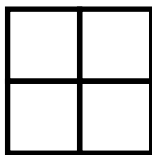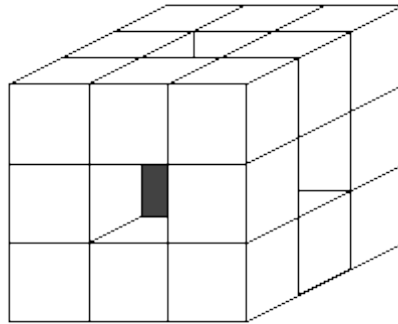
21. Calculate the missing angles *p*, *q* and *r*.

$35°$ p

angle p = _____

q

$81°$ $52°$

angle *q =* _____

$140°$ $24°$ r *angle r =* _____

$24°$
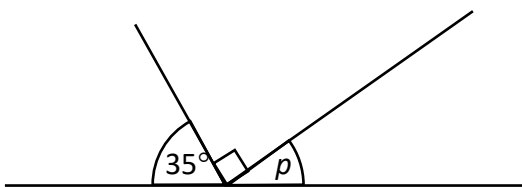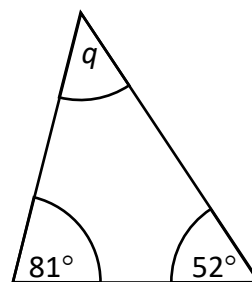
22. A cube measuring 3cm × 3cm × 3cm is made up of small cubes and has a 1cm × 1cm square hole pushed right through the centre of each face so that you can see straight through the cube from every side.
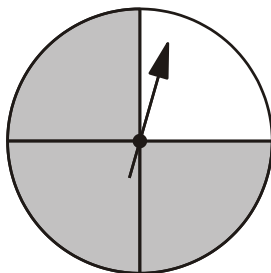

How many small cubes are used to make this shape?

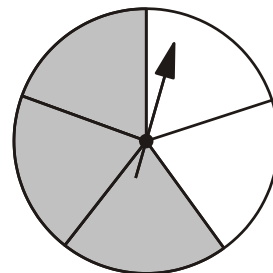23. The diagram shows five fair spinners with grey and white sectors.
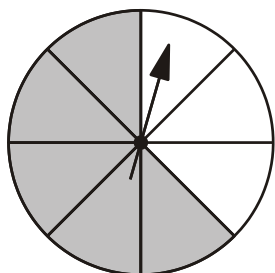
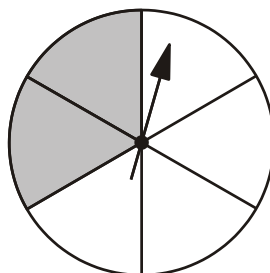Each spinner is divided into equal sectors.
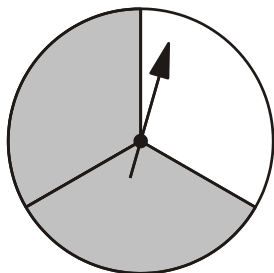
A

B

C

D

E

I am going to spin all the pointers.

(a)   For one of the spinners, the probability of spinning grey is $\frac{3}{4}$

Which spinner is this?

(b)   For two of the spinners, the probability of spinning grey is more than 60% but less than 70%

Which two spinners are these?

24. Betty carried out a survey.
She asked some students in year 9 which types of film they liked best.

She used the results to draw this pie chart.
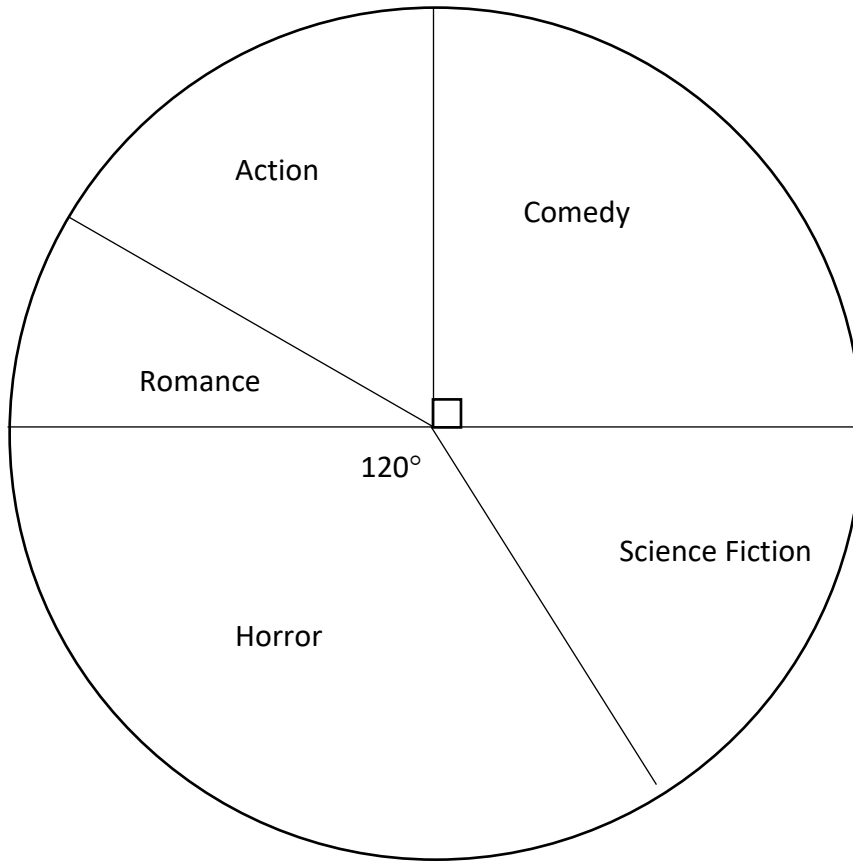
Not drawn accurately

a) What fraction of students said "Comedy"?

20 students said "Horror".

b) Work out the total number of students that Betty asked.

CHALLENGE QUESTION

25. What is the sum of all the numbers from 1 to 100?

(You are <u>not</u> expected to work this out by adding 100 numbers together! Try to find a way to do the puzzle and show how you worked it out!)