BROMSGROVE SCHOOL

ENTRANCE EXAMINATION PAPERS

YEAR 9 ENTRY

MATHEMATICS

Student's Name: _____

(Block Capitals)

Date Test Taken: _____

Students Date of Birth: _____

Answer as many questions as you can in the spaces provided. Do not worry if you do not finish. You should have a calculator; its use is expected. Show your working clearly as credit will be given for this in the event of an incorrect answer. **You have one hour for this paper.**

1 The first four terms of a number sequence are:

5 9 13 17

a. Write down the next two terms of the sequence

_ _

The 20th term of the sequence is 81

b. Work out the 22nd term of the sequence

_ _

The 31st term of the sequence is 125

c. Work out the 30th term of the sequence

_ _

d. What is the formula for the nth term of the sequence

_ _

2 Here are 8 letters:

A	F	H	N
P	S	U	X

a. Write down the two letters which have exactly one line of symmetry.

_ _

b. Which two letters have rotational symmetry of order 2 and **two** lines of symmetry?

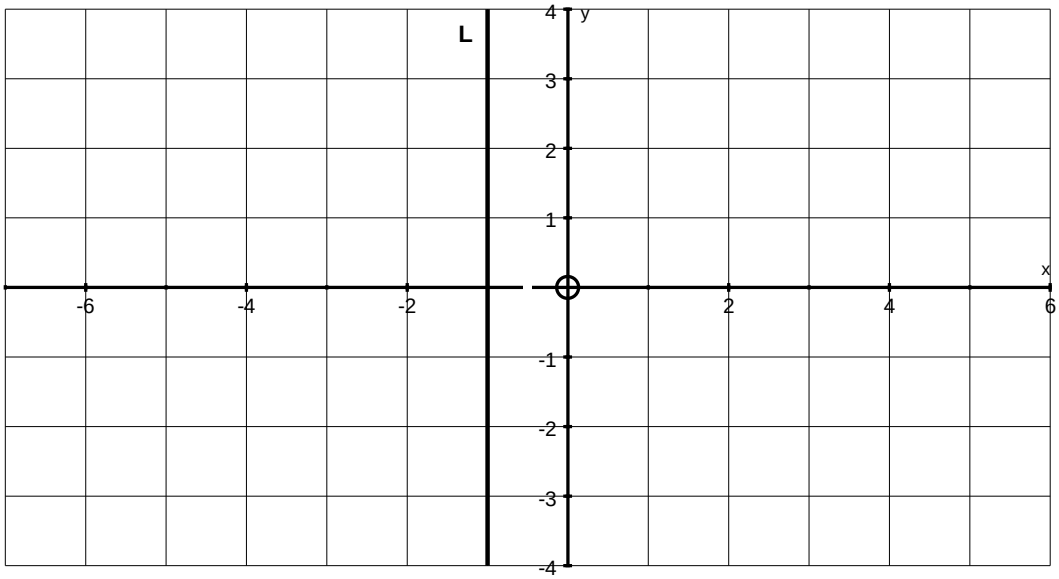
_ _

c. Which two letters have rotational symmetry of order 2 and **no** lines of symmetry?

_ _

3 Plot the points on the diagram below and join them up

A(1, -1) B(1,1) C(3, 1) D(2, -1)



a. What is the name of the shape above?

_ _

b. On the diagram, reflect the shape in the line L.

4 a. Write $0 \cdot 35$ as a fraction in its lowest terms.

_ _

b. Write $^{67}/_{100}$ as a decimal.

_ _

c. Calculate $3^4 - 4^3$.

_ _

d. What is the square root of 36?

_ _

5 The temperature at noon on a winter's day is 9°C. By midnight it has fallen by 15°C. What is the temperature at midnight?

_ _

6 a. Simplify the expression $7a+4b-3a-5b$

b. Multiply out the brackets $3(2x-5y)$

7 a. What is $^3/_8$ of £44 ?

b. What is 60% of 55 kilogrammes ?

c. If 3 pupils out of 20 pupils were absent, what percentage of pupils was absent?

d. I think of a number. When I multiply it by 5 and add 4 the result is 39. What is the number I thought of ?

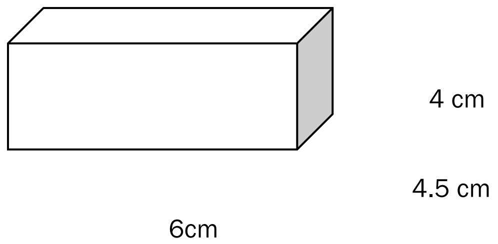
8 Solve these equations :

a. $5x-12=27$

b. $3(5+x)=5(x-2)$

9 A train leaves London at 11:22 and arrives in Birmingham at 14:08 , how long did the journey take ?

10 a



Not to scale

The cuboid has length 6 cm, width 4.5 cm and height 4 cm.
Find the volume of the cuboid, stating the units clearly.

_ _

_ _

b The volume of another cuboid is 42 cm^3. The length, width and height are all **different whole** numbers. Give one set of possible values for length, width and height.

_ _

11 A particular shade of green paint is made by mixing three parts of yellow paint to two parts of blue paint.

a. How much green paint can be made with 6 litres of blue paint ?

_ _

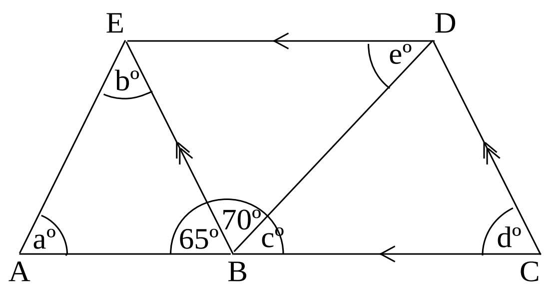
_ _

b. How much blue paint is needed to make 45 litres of green paint ?

_ _

_ _

12 In the diagram, AE = BE and BCDE is a parallelogram.



NOT TO SCALE

Write down the size of the following angles.

a _ _ _ _ _ b _ _ _ _ _ c _ _ _ _ _ d _ _ _ _ _ e _ _ _ _ _

13 The heights, in metres, of five friends are 1·40, 1·38, 1·31, 1·52 and 1·42. What is their mean height ?

14 a. A circle has diameter 4 centimetres, what is its circumference ?

b. A circle has radius $7 \cdot 4$ centimetres, what is its area ?

15 If $x = -2$, $y = -4$ and $z = 3$, write down the values of

a. xyz

b. $2x - 3y$

16 Solve the simultaneous equation:
$$6m + 4n = 25$$
$$12m - n = 14$$

17 If there are 12 inches in 1 foot and about 2.5 cm in an inch.

a. Find the height in centimetres of a 6 feet tall man.

b. Convert 4 metres to feet and inches

18 Simplify:

a. $5d \times 8d$

b. $12j + 7j^2 - 5j^2 - 17j$

19 Write the following in standard form

a. 45 600 000 000

b. 0.000 027

c. The distance from Earth to the Sun is 150 million **km**. The speed of light is 3×10^8 m/s. How many seconds does it take for light to travel from the Sun to Earth. Give your answer in standard in form.

20 Factorise

a. $8x^2 - 4x$

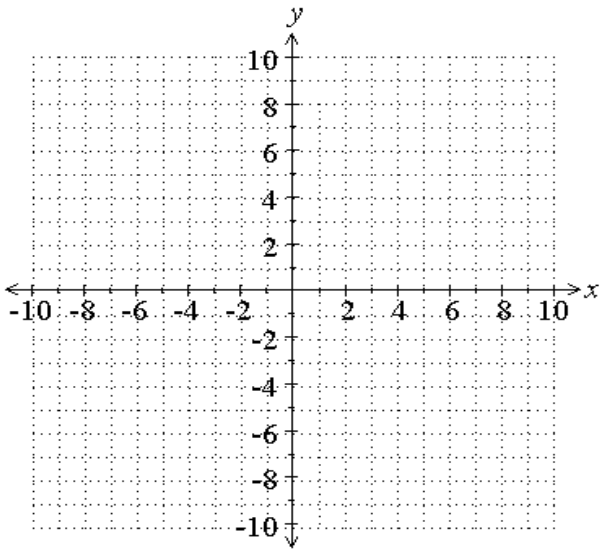
b. $x^2 + 6x - 16$

21 Triangle T has vertices at (3,4), (3,6) and (6,6), draw and label T on your diagram.

a) T is rotated clockwise through 90° about (0,0) to get T ', draw and label T ' on your diagram.

b) T ' is rotated anticlockwise through 90° about (-3,-3) to get T" , draw and label T" on your diagram.

c) What transformation will map T " back onto T .



End of Test