



**EMANUEL SCHOOL ENTRANCE EXAMINATION**  
**Mathematics**

*Sample Examination Paper*

Hill Form (10+) Entry

Time allowed : 1 hour

1.	Your first name <b>and</b> surname.
2.	Your present school.
3.	Boy/girl:

Fill in the boxes above and read the following carefully :-

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1. **There are 28 questions.** You should attempt all of them in any order you like.
2. **Write neatly and show all your working.** It may be possible to give you marks if your working makes sense even if your final answer is wrong.
3. **Put your answer in the space provided.** If you think you have finished check that you have answered all the questions.
4. **Keep an eye on the time.** Work carefully and steadily. If you find yourself spending too long on a question move on to another one.
5. **You may NOT use a calculator.**

**Good luck!**

## 1. Mental Arithmetic

Do these questions in your head. So do not show any working. Write the answers in the space beside the question.

a)  $9 + 6$  .....

b)  $15 - 7$  .....

c)  $11 \times 7$  .....

d)  $24 \div 8$  .....

e)  $13 \times 3$  .....

f)  $50 - 18$  .....

g)  $16 + 19$  .....

h)  $72 \div 9$  .....

i)  $7 \times 7$  .....

j)  $78 \div 6$  .....

## 2. Do the following

a) 
$$\begin{array}{r} 42 \\ + 56 \\ \hline \end{array}$$

\_\_\_\_\_

b) 
$$\begin{array}{r} 85 \\ - 37 \\ \hline \end{array}$$

\_\_\_\_\_

c) 
$$\begin{array}{r} 785 \\ + 541 \\ \hline \\ \hline \end{array}$$

d) 
$$\begin{array}{r} 867 \\ - 382 \\ \hline \\ \hline \end{array}$$

3. Work out  $53 + 3209 + 664$

Answer \_\_\_\_\_

4. Do the following multiplications

a) 
$$\begin{array}{r} 17 \\ \times 3 \\ \hline \\ \hline \end{array}$$

b) 
$$\begin{array}{r} 56 \\ \times 4 \\ \hline \\ \hline \end{array}$$

c) 
$$\begin{array}{r} 732 \\ \times 9 \\ \hline \\ \hline \end{array}$$

5. Work out the following

a)  $4 \overline{)2748}$

Answer \_\_\_\_\_

b) 17144 divided by 8

Answer \_\_\_\_\_

6. Add together

two thousand three hundred and seven  
AND  
one thousand and twenty-four.

Answer \_\_\_\_\_

7. When two numbers are added together the total is 32.  
When the same two numbers are multiplied the result is 240.  
Find the two numbers.

Answer \_\_\_\_\_ and \_\_\_\_\_.

8. What number must fit into the squares to make these sums correct?

a)  $34 + \square = 91$

b)  $72 - \square = 39$

c)  $\square \times 7 = 119$

d)  $448 \div \square = 8.$

9. Sam takes a £20 note to a restaurant. He buys a burger for £3.99, a milk shake for £1.65, and a fudge sundae for £1.80

a) How much money does he spend altogether? £ \_\_\_\_\_

b) How much change should he get from the £20 note? £ \_\_\_\_\_

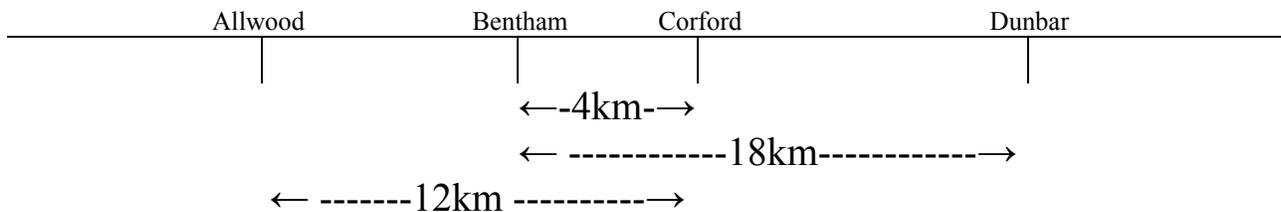
10. a) 4 British coins in Jo's pocket add up to 73p.  
What are they?

Answer \_\_\_\_\_

- b) 5 British coins in Arati's pocket add up to 61p.  
Three of the coins are the same.  
What are the 5 coins?

Answer \_\_\_\_\_

11. On a very long straight road there are four villages:  
Allwood, Bentham, Corford and Dunbar, which are shown in the  
diagram below.



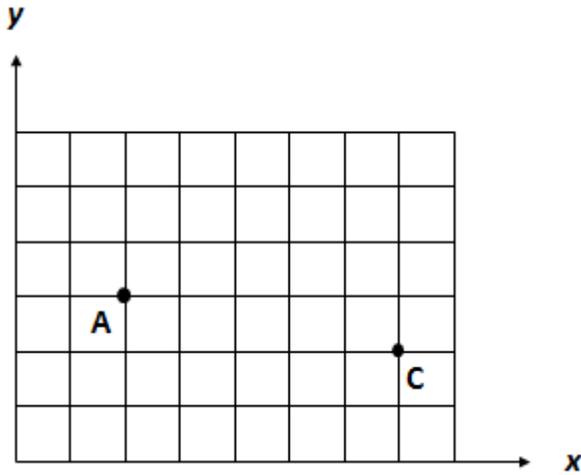
The arrows show distances between villages.

Find the distances from

- a) Corford to Dunbar                      Answer \_\_\_\_\_

- b) Allwood to Dunbar                      Answer \_\_\_\_\_

12.



On the axes shown A is the point (2,3)

- a) Write down the coordinates of the point C. (   ,   )
- b) Mark on the diagram the point B which is (5,5).
- c) Mark on the diagram the point D so that ABCD is a square.

13.

	Angola	Namibia	Zimbabwe	Zambia
Population	10 002 000	1 203 000	9 369 000	8 456 000
Area in square kilometres	1 246 700	823 168	390 759	752 614
Highest mountain in metres	2610	2579	2592	2164

The table above shows some information about four African countries. Answer the following questions using the table.

- a) Which country has the largest area? \_\_\_\_\_
- b) Which country has the smallest population? \_\_\_\_\_
- c) Which country has the third highest mountain? \_\_\_\_\_
- d) Which country is the most densely populated (most people for each square kilometre of land)? \_\_\_\_\_

14. Sophie thinks of a number, doubles it and adds 8.  
The answer was 26. What was the number she was thinking of?

Answer \_\_\_\_\_

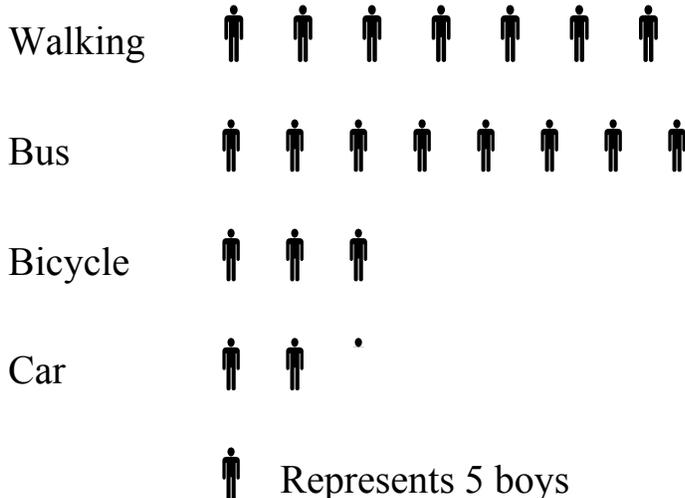
15. Find the next two numbers in each of the following sequences

- a) 1, 8, 15, 22, 29, \_\_\_\_\_, \_\_\_\_\_  
b) 4, 6, 9, 13, 18, \_\_\_\_\_, \_\_\_\_\_  
c) 96, 48, 24, 12, 6, \_\_\_\_\_, \_\_\_\_\_  
d) 3, 4, 7, 11, 18, 29, \_\_\_\_\_, \_\_\_\_\_

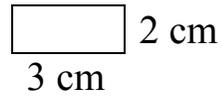
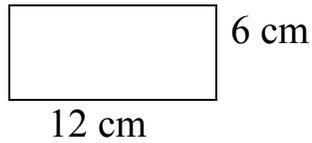
16. Below is a pictogram showing the method by which year seven boys come to school. How many

a) come by bus Answer \_\_\_\_\_

b) come by car Answer \_\_\_\_\_



17.



a) What is the area of the rectangle

Answer \_\_\_\_\_

b) How many small rectangles of the size shown will fit into the rectangle above?

*Neither diagram is drawn to scale.*

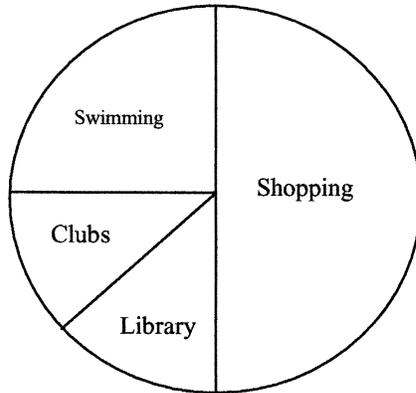
Answer \_\_\_\_\_

18.

In the British Army there are 4500 men who are taller than 180 cms. Of these 750 are taller than 190 cms. How many men are there who are between 180 and 190 cms tall?

Answer \_\_\_\_\_

19.



The pie chart shows the activities of a group of children on a Saturday morning. 8 children went to the library.

- a) How many children went swimming? \_\_\_\_\_
- b) How many children went shopping? \_\_\_\_\_
- c) How many children were there altogether in the group? \_\_\_\_\_

20.

When aunt Jane comes to visit, Tom always goes out to play. Last Sunday, aunt Jane came to visit. It was raining.

The following sentences are either TRUE, or FALSE, or NOT CERTAIN. Ring the one you think applies to each sentence.

- a) Tom went out to play. (True / False / Not certain)
- b) Aunt Jane and Tom both went out to play. (True / False / Not certain)
- c) As it was raining Tom stayed inside last Sunday. (True / False / Not certain)

21.

A train leaves London at 10.35 a.m. and arrives in Exeter 3 hours and 35 minutes later. What time does it arrive?

Answer \_\_\_\_\_

22.

$$576 \times 8 = 4608$$

$$23040 + 4608 = 27648$$

Without doing any more calculations give the answers to:

a)  $576 \times 4 =$  \_\_\_\_\_

b)  $576 \times 40 =$  \_\_\_\_\_

c)  $576 \times 48 =$  \_\_\_\_\_

d)  $27,648 - 23,040 =$  \_\_\_\_\_

23.

A list of angles is given below

$179^\circ$ ,  $10^\circ$ ,  $47^\circ$ ,  $273^\circ$ ,  $81^\circ$ ,  $330^\circ$

How many acute angles are there in the list? \_\_\_\_\_

24. A rule for a number sequence is 'multiply by 2 and subtract 7'.

a) Write down the next number in the sequence

$8 \rightarrow 9 \rightarrow 11 \rightarrow 15$  \_\_\_\_\_

b) Here is part of another number sequence with the same rule.  
Write down the first number which is missing.

\_\_\_\_\_  $\rightarrow 17 \rightarrow 27 \rightarrow 47 \rightarrow 87$

25. Put a single number in the boxes to make each of these sums correct

a)

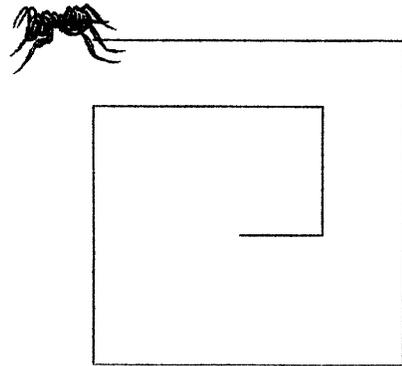
$$\begin{array}{r} 6 \quad \square \quad 5 \\ + 2 \quad 2 \quad 7 \\ \hline 0 \end{array}$$

b)

$$\begin{array}{r} 5 \quad \square \quad 4 \\ - 2 \quad 7 \quad 9 \\ \hline 0 \end{array}$$

26.

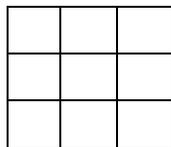
The diagram shows Woody the ant setting off for a walk he took recently in search of food. On this journey Woody walked a certain distance and turned right. Each time he turned right he walked 2 metres less than he did the time before.



On the last part of his journey before stopping he walked one metre. How far did he walk altogether?

Answer \_\_\_\_\_

27.



Draw out a 3 by 3 grid like that shown.

Place the numbers 2 2 2 3 3 3 4 4 4 in it so that when any line of three numbers is added up in any direction (including diagonally), the total is always 9.

Answer \_\_\_\_\_

28. Choose from this set of numbers

5, 6, 7, 8, 9, 10, 11, 12

a) two multiples of 6      Answer \_\_\_\_\_ and \_\_\_\_\_.

b) two factors of 18      Answer \_\_\_\_\_ and \_\_\_\_\_.

c) a square number      Answer \_\_\_\_\_ and \_\_\_\_\_.

d) two prime numbers      Answer \_\_\_\_\_ and \_\_\_\_\_.

**Well done! This is the end of the test.**

**Now check your answers carefully.**