



# ALDENHAM SCHOOL

## 13 + Entrance Paper

### SAMPLE PAPER

#### Mathematics

Length of Examination – one hour

**Do not open until you are told to do so**

Surname: ..... School:.....

First name: ..... Age: Years ..... Months .....

#### INSTRUCTIONS FOR CANDIDATES

- Write your answers in the spaces provided in this booklet
- Show sufficient method to show how you obtained your answers
- Calculators **MUST NOT** be used in any question.

Work steadily through the paper doing as much as you can straight away. Then go back to work at the more difficult questions. Make sure you have attempted to answer all the questions. There are 36 questions on this paper.

1. Work out  $7.65 + 6 + 3.7$

.....[2]

2. Work out  $\frac{5}{6} + \frac{1}{2}$ , giving your answer in its simplest form

.....[2]

3. a. Work out  $26 \times 18$

.....[2]

b. Without any further calculations write down the value of

$0.26 \times 180$

.....[1]

4. Work out

a.  $\frac{1}{4}$  of 3000

.....[1]

b.  $\frac{3}{4}$  of 3000

.....[1]

5. Write  $6\frac{2}{7}$  as an improper fraction.

.....[1]

6. Fill in the missing number

$$-7 - \square = -15$$

.....[1]

7.

2	5	8	13	14	15	25	33	42	64
---	---	---	----	----	----	----	----	----	----

From the numbers in the box above, write down

a. the largest odd number

.....[1]

b. a square number

.....[1]

c. a prime number between 10 and 20

.....[1]

d. a multiple of 7

.....[1]

e. a number which is a square number AND a cube number

.....[1]

[Total 5]

8. Work out  $425 \div 17$ , showing your method clearly.

.....[2]

9. Calculate  $10 \div \frac{5}{8}$ .

.....[2]

10. Fill in the missing number

$$8 - \square = 14$$

.....[1]

11. Write 48 and 60 as products of their prime factors.

$$48 = \dots\dots\dots$$

$$60 = \dots\dots\dots[2]$$

Hence or otherwise, find the Highest Common Factor and the Lowest Common Multiple of 48 and 60.

$$\text{HCF} = \dots\dots\dots$$

$$\text{LCM} = \dots\dots\dots[2]$$

[Total 4]

12. Write  $\frac{5}{8}$  as a decimal

$$\dots\dots\dots[2]$$

13. Work out  $\frac{3}{5} \times \frac{10}{21}$ , giving your answer in its simplest form.

.....[2]

14. A fleet of lorries are identical to each other and each carry the same amount. Six lorries can carry 7 tonnes of stone altogether. How much stone can nine lorries carry?

.....tonnes[3]

15. Which fraction is larger,  $\frac{11}{12}$  or  $\frac{10}{11}$ ? Give a clear reason for your answer, showing any working that you do.

.....[2]

16. Bill and Fred are brothers. Bill is 12 years old and Fred is 8 years old. Every week their mum gives them £25 pocket which they need to share between them in the ratio of their ages. How much pocket money does Fred receive?

.....[3]

17. Simplify as far as possible:  $9q - 4 + 13p - 12q - 7p + 5$

.....[2]

18. Find the value of  $3x^2 + 2x - 5$   
when  $x = 3$ .

.....[2]

when  $x = -3$

.....[2]

[Total 4]

19. Solve the equation:

$$5x - 12 = 3$$

.....[2]



20. When I hire a boat to go fishing I am charged a fixed charge of £20 and an additional £15 an hour. What will the cost of hiring the boat for six hours be?

£.....[2]

21. Simplify as far as possible:  $2p \times 3q \times 5p$

.....[2]

22. Solve the equation:

$$\frac{x}{3} + 6 = 10$$

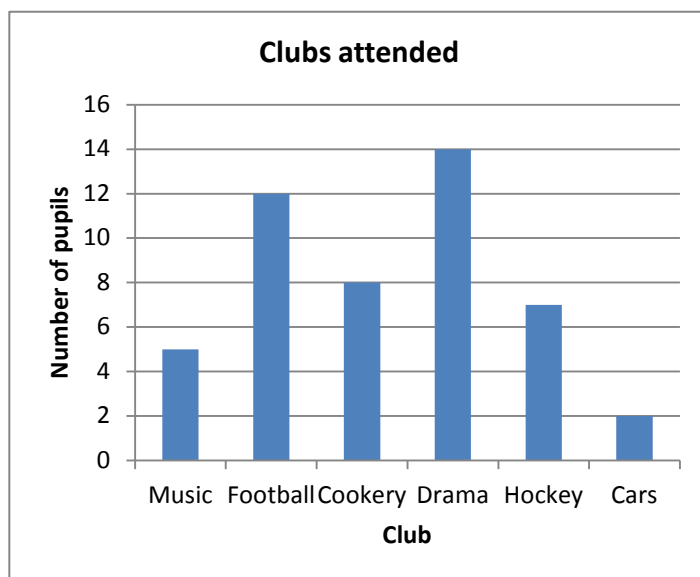
.....[2]

23. Multiply out the following bracket:

$$5(y - 4)$$

.....[2]

24. The following bar chart shows information about the numbers of pupils attending clubs after school one day.



If one pupil is chosen at random, what is the probability that they attend a sports club after school?

.....[3]

25. Expand and simplify:

$$4(x + 3) - 2(x - 5)$$

.....[2]

26. Simplify as far as possible:

$$3y^2 + x - 2y^2 + 3x$$

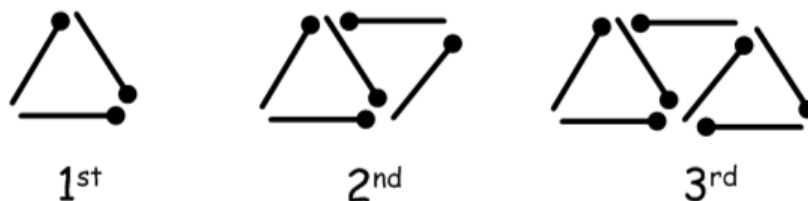
.....[2]

27. To work out the cost of the electricity I use at home I need to multiply the number of units I use by 3 and then add 750 to get the cost in pence.

Write a formula for the cost C, in pence, of using n units of electricity.

.....[2]

28. Mahesh makes a pattern using matchsticks like this:



(a) Draw the next two shapes in the pattern.

.....[2]

(b) How many matchsticks would there be in the 7<sup>th</sup> shape?

.....[2]

(c) How many matchsticks would there be in the n<sup>th</sup> shape

.....[2]

(d) Hence or otherwise work out how many matchsticks there would be in the 50<sup>th</sup> shape.

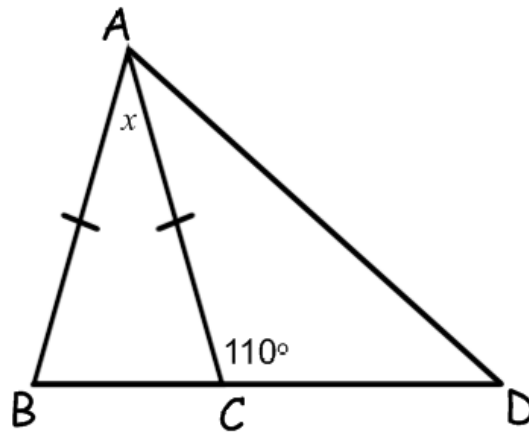
.....[2]

[Total 8]

29. Solve the equation  $\frac{5x}{4} = 25$ .

$x = \dots\dots\dots$ [2]

30. Angle ACD is  $110^\circ$ .  $AB = AC$ .  
Work out the size of angle BAC.



$x = \dots\dots\dots$ [1]

Give reasons for your answer:

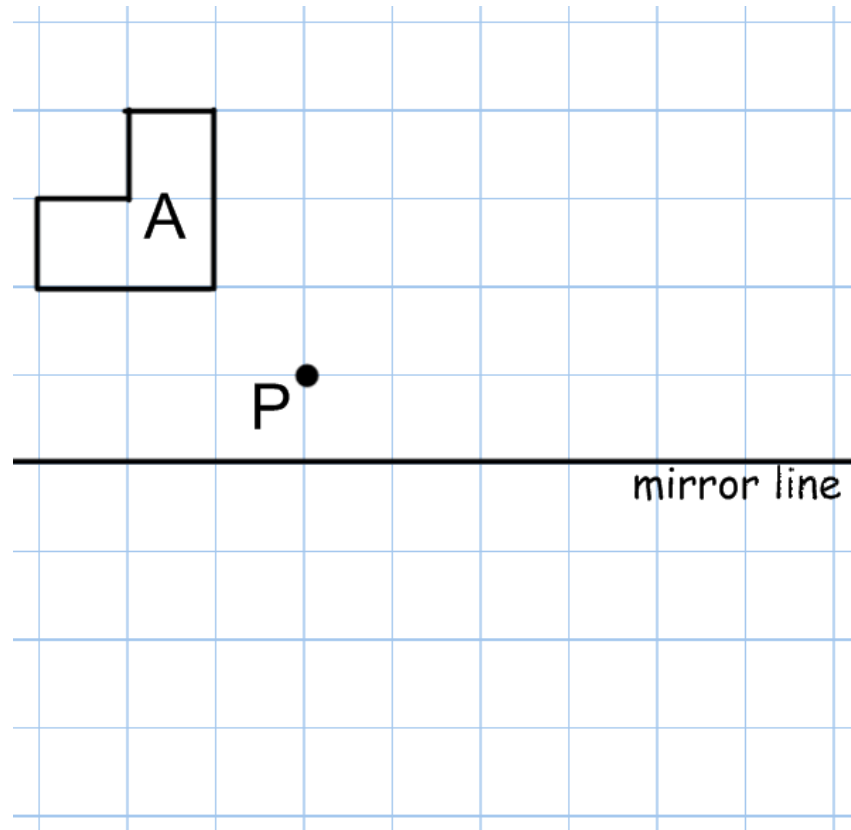
.....  
.....  
.....

[2]

[Total 3]

31.

a. Rotate shape A  $90^\circ$  clockwise about point P and label the image B.



[2]

b. Reflect shape B in the mirror line and label the image C.

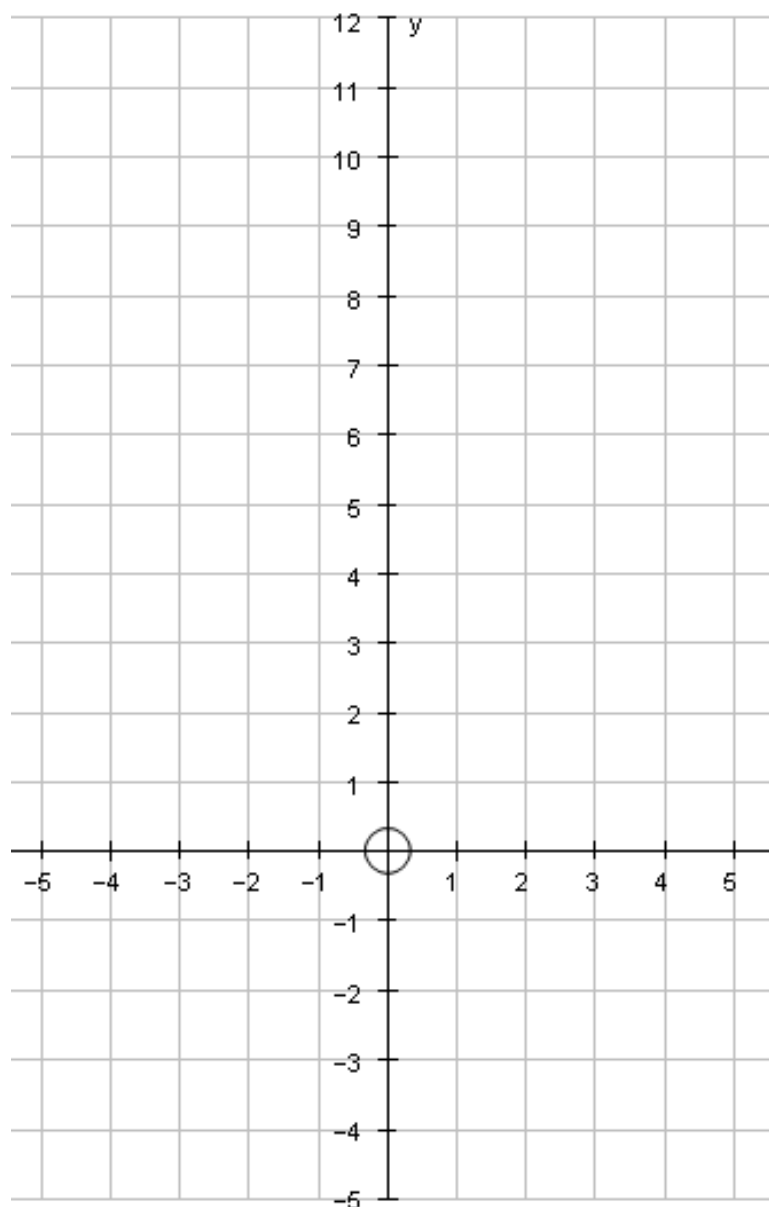
[2]

[Total 4]

32. On the diagram below, draw the graph whose equation is  $y = 2x - 1$ . Make sure you complete the table of values first.

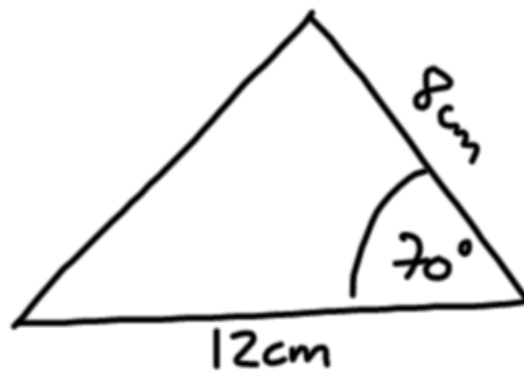
<b>x</b>	<b>-2</b>	<b>1</b>	<b>3</b>
<b>y</b>			

[2]



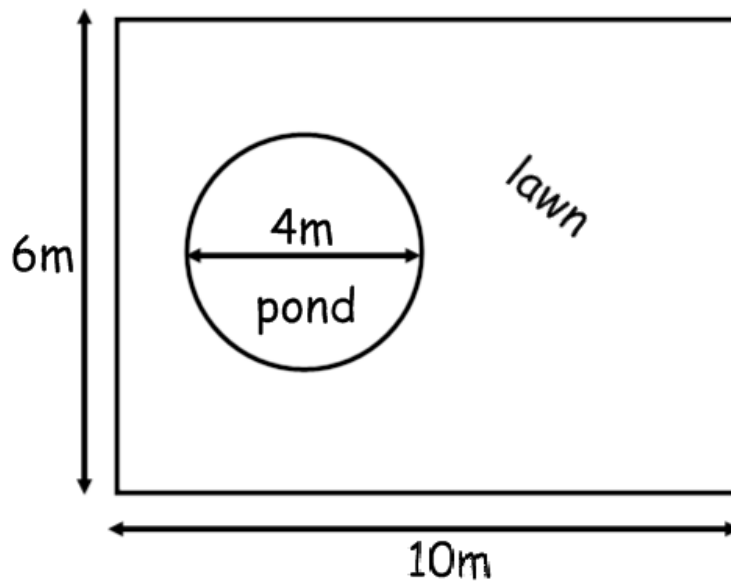
[2]  
[Total 4]

33. Here is a sketch of a triangle. Make an accurate drawing of the triangle.





34. Below is a plan of Mike's garden. It consists of a rectangular lawn with a circular pond in it.



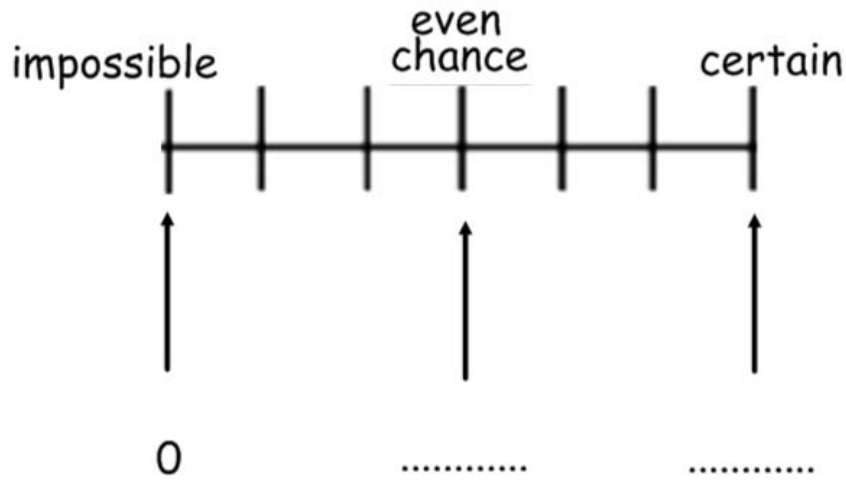
- (a) What is the circumference of the pond (use  $\pi = 3$ )?

.....m[2]

(b) Mike wishes to buy seed for his lawn. One box of seed costs £3.98 and covers  $20\text{m}^2$ . How much will he need to spend on lawn seed? Show all your working out.

£..... [4]  
[Total 6]

35. Look at the probability scale below.



a. Complete the scale by writing numbers to represent the probabilities for even chance and certain.

[2]

b. On the scale above, mark the following probabilities with the letters shown:

A the probability that when a fair dice is rolled, the top face shows a number greater than 2.

[1]

B the probability that when a fair dice is rolled, the top face shows a square number.

[1]

[Total 4]

36. Railfares and Cheapfares are two websites selling train tickets.

Each of the websites adds a credit card charge and a booking fee to the ticket price.

**Railfares**

Credit card charge: 2.5% of ticket price

Booking fee: 80 pence

**Cheapfares**

Credit card charge: 1.3% of ticket price

Booking fee: £1.90

Nadia wants to buy a train ticket.  
The ticket price is £60 on each website.  
Nadia will pay by credit card.

Will it be cheaper for Nadia to buy the train ticket from Railfares or from Cheapfares?

[Total 4]

---

**END**

**[Total 100]**