

Surname ..... Candidate number .....

First name .....

Current school .....



# Entrance Examination 2011

## Arithmetic Paper 1

**30 minutes**

**Do not open this booklet until told to do so**  
**Calculators may not be used**

Write your names, school and candidate number in the spaces provided at the top of the page.

You have 30 minutes for this paper which is worth 20 marks.

Answer all the questions, attempting them in order and writing your answers clearly. If you find that you cannot answer a question straight away leave it blank and return to it later if you have time. Do not leave blank answer spaces, make the best attempt at an answer that you can.

If you need to change an answer cross it out neatly and write the new answer alongside the box.

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	Marker 1	Marker 2	Agreed mark
Number correct	<input type="text"/>	<input type="text"/>	<input type="text"/>
Number wrong	<input type="text"/>	<input type="text"/>	

1. Work out  $483 + 249$ .

1

2. Work out  $187 \times 60$ .

2

3. Work out  $22\frac{1}{2} \div 5$ .

3

4. Write in figures the number one million ten thousand and one.

4

5. What is the product of the sum of 8 and 4 with the difference of 3 and 12?

5

6. How many 2-digit numbers contain at least one 4?

6

7. A baby crocodile grows by  $\frac{1}{5}$  of its length every week. Today it is 30cm long. How long was it last week?

7

cm

8. Rodger has seven cubes, each one with edges 1 cm long. He glues one face of each of six of the cubes, and sticks them, one to each face of the seventh. He then paints the shape he has made. What area is painted?

8

cm<sup>2</sup>

9. Neil drives his car for 20 minutes at 45 kilometres per hour. Stephen does the same journey at a speed of 30 kilometres per hour. How long did it take him?

9

mins

10. A child's building brick measures 2 centimetres by 3 centimetres by 4 centimetres. What is the greatest number of these bricks which can be packed into a box which measures 16 centimetres by 15 centimetres by 10 centimetres?

10

11. Work out 15% of £3.

11	<input type="text"/>	p
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12. The facsum of a number is the sum of all its factors.

For example, the facsum of 6 is 12 because

$1 + 2 + 3 + 6 = 12$ . Work out the facsum of 20.

12	<input type="text"/>
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13. Write 0.36 as a fraction in its simplest form.

13	<input type="text"/>
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14. I have some 20p pieces. I have twice as many 10p pieces as 20p pieces. I have twice as many 5p pieces as I have 10p pieces. I have £4.80 altogether. How many coins do I have?

14	<input type="text"/>
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15. Irfan is standing in a queue of 24 people.

What position is he in the queue if there are 7 more people ahead of him than behind him?

15	<input type="text"/>
----	----------------------

16. How much is  $\frac{3}{4}$  of  $\frac{2}{5}$  of £1?

16	<input type="text"/>	p
----	----------------------	---

17. Three CDs and two DVDs cost £43. Two CDs and three DVDs cost £47. What is the cost of one CD?

17	<input type="text"/>	£
----	----------------------	---

18. The area of a rectangle is 72 square centimetres.

The length of the rectangle is 1 cm more than the width.

Work out the length of the perimeter of the rectangle.

18	<input type="text"/>	cm
----	----------------------	----

19. Four boys have an average mass of 50 kg and

six girls have an average mass of 40 kg.

What is the average mass of the ten children?

19	<input type="text"/>	kg
----	----------------------	----

20. Ten cards numbered from 1 to 10 are put in order in a pile, with 1 on the top. I move one card from the top and place it at the bottom, and then throw the new top card away. Then I put the new top card to the bottom, and this time a second top card to the bottom, before throwing away the next one. Now I put the new top card to the bottom, the next top card to the bottom, and now a third top card to the bottom, before throwing the next one away. Finally, I put the top card to the bottom, the next top card to the bottom, the next top card to the bottom, a fourth top card to the bottom, and throw away the next card. What number is on the card now at the top of the pile?

20	<input type="text"/>
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**END OF PAPER**

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Surname ..... Candidate number .....

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# Entrance Examination 2011

## Arithmetic Paper 2

**1 Hour**

**Do not open this booklet until told to do so**  
**Calculators may not be used**

Write your names, school and candidate number in the spaces provided at the top of the page.

Show all your working in full, as this will be marked, and then write your answer clearly. If you run out space for an answer, use the space provided at the end of the booklet, numbering your answer carefully.

1. To bake 2 cakes, Jo uses

300g	flour
8	eggs
7	tablespoons of milk
38g	coconut
1.4 ml	vanilla essence

Write down the amounts she needs for 5 cakes

	flour
	eggs
	tablespoons of milk
	coconut
	vanilla essence

**[5 marks]**

2. Write numbers in the boxes to make this division correct

(a)

$$\begin{array}{r} 8 \quad \square \quad 7 \\ \square \overline{) 6616} \end{array}$$

(b) Write numbers in the boxes to make this subtraction correct

$$\begin{array}{r} \square \quad 0 \quad 1 \quad 5 \\ - 4 \quad 2 \quad \square \quad 2 \\ \hline 2 \quad \square \quad 8 \quad 3 \\ \hline \end{array}$$

[5 marks]

Please turn over

3. A clock shows 2 o'clock, with the minute hand on 12 and the hour hand on 2.

(a) How many times does the minute hand go past the hour hand between 2.00pm and 7.00pm?

3a	<input type="text"/>
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(b) What time will the clock show when the hour hand has turned through an angle of  $60^\circ$ ?

3b	<input type="text"/>
----	----------------------

(c) What time will the clock show when the minute hand has turned through an angle of  $900^\circ$ ?

3c	<input type="text"/>
----	----------------------

(d) Through what angle will the minute hand have turned from 2 o'clock, when the clock shows 10 o'clock?

3d	<input type="text"/>
----	----------------------

(e) Through what angle will the hour hand have turned from 2 o'clock, when the clock shows 6:30?

3e	<input type="text"/>
----	----------------------

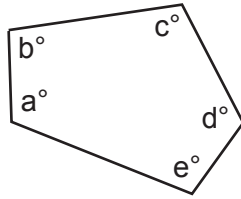
**[5 marks]**



4. The formula to work out the sum of the angles inside any shape is

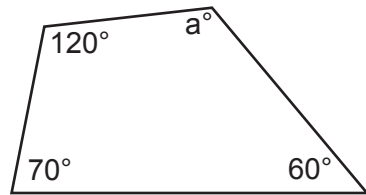
$$\text{Sum of angles} = 180^\circ \times \text{number of sides} - 360^\circ$$

For example,



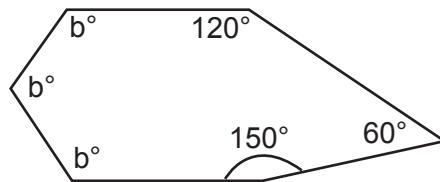
$$\begin{aligned} a + b + c + d + e &= 180^\circ \times 5 - 360^\circ \\ &= 900^\circ - 360^\circ \\ &= 540^\circ \end{aligned}$$

(a) Find a



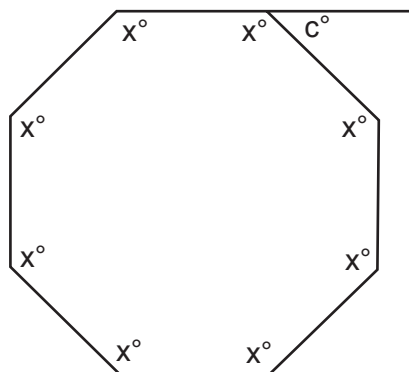
4a	
----	--

(b) Find b



4b	
----	--

(c) Find c



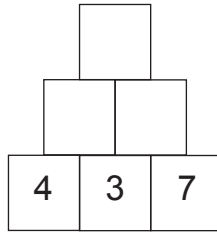
4c	
----	--

[5 marks]

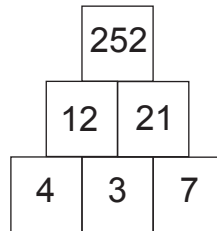
Please turn over

5. In this pyramid of bricks, after the bottom row, the number on each brick is the product of the two bricks underneath it.

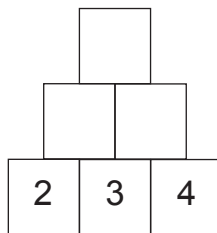
For example, if we start with



we end up with



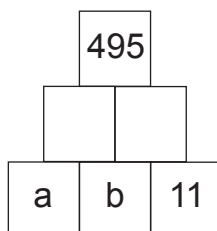
- (a) Fill in the remaining numbers on the bricks



- (b) Fill in the numbers on the bottom row

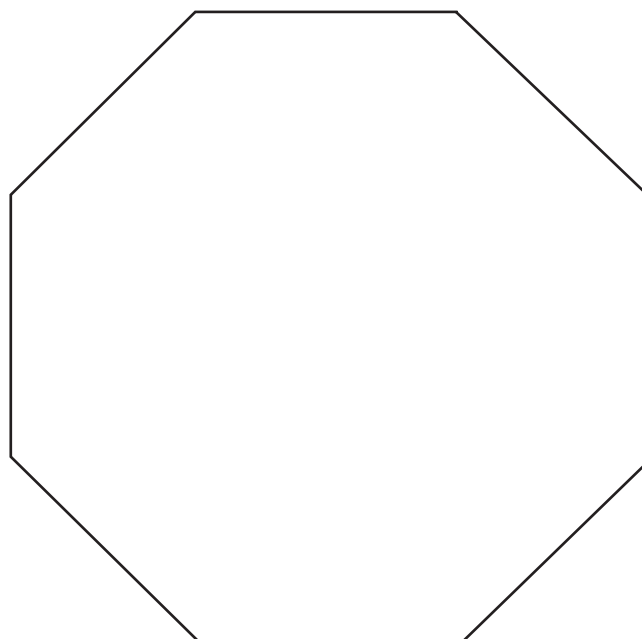
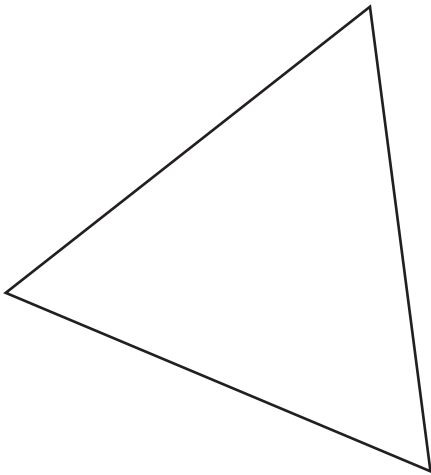
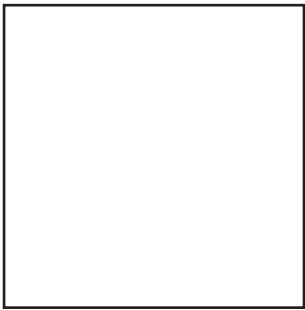


- (c)  $a$  and  $b$  are whole numbers, neither of which is 1.  
Find the values of  $a$  and  $b$ .



**[5 marks]**

6. Draw in all the axes of symmetry in these shapes.  
If any shape has no axes of symmetry, write NONE inside the shape.



[5 marks]

Please turn over

7. (a) Write down a number which has exactly three factors, including 1 and itself.

7a	<input type="text"/>
----	----------------------

- (b) Write down the smallest multiple of 17 which is greater than 200.

7b	<input type="text"/>
----	----------------------

- (c) Write down a prime number between 90 and 100.

7c	<input type="text"/>
----	----------------------

- (d) Write down a fraction which is between  $\frac{1}{3}$  and  $\frac{1}{2}$ .

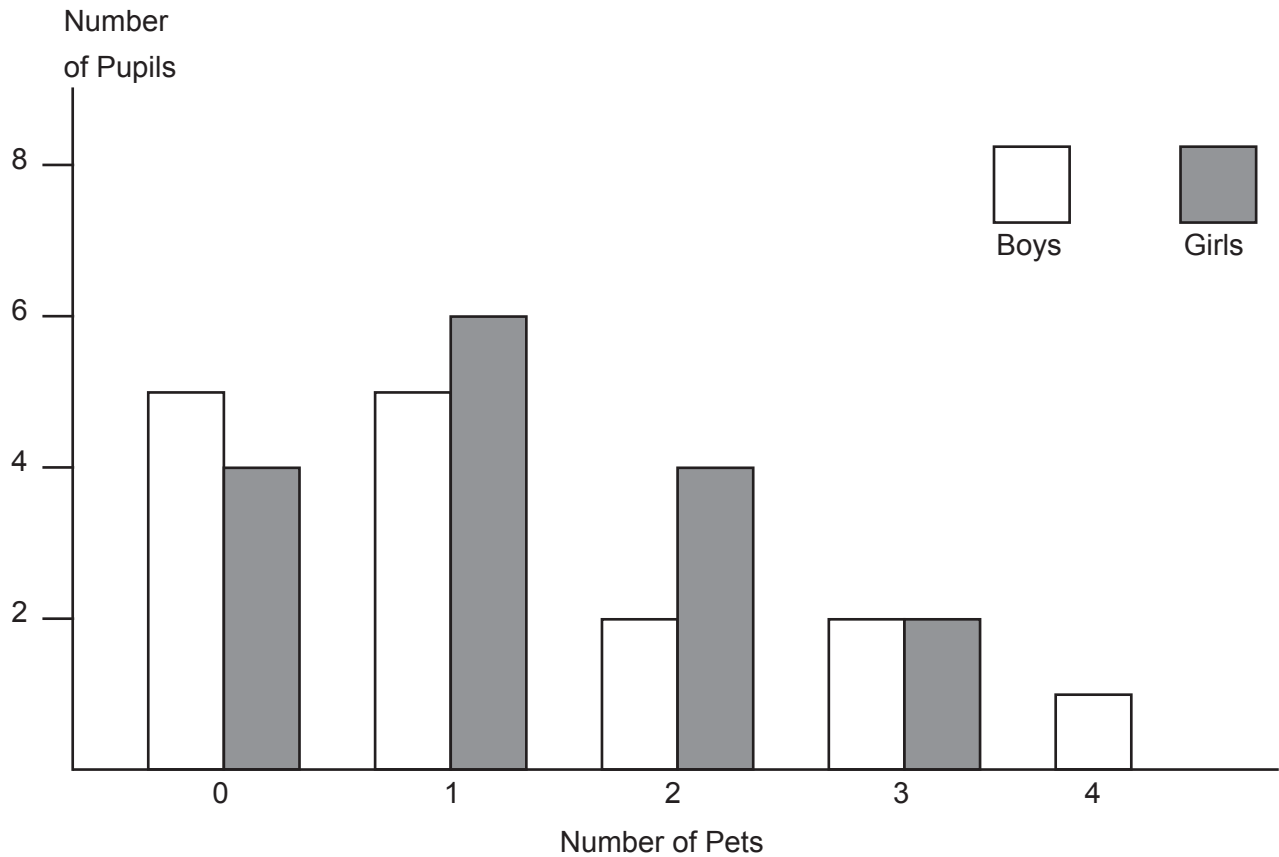
7d	<input type="text"/>
----	----------------------

- (e) Write down a number whose square is between 400 and 450.

7e	<input type="text"/>
----	----------------------

**[5 marks]**

8.



The graph shows the number of pets owned by the children in a primary school class.

(a) How many girls own 2 pets?

8a

(b) How many more girls than boys are there in the class?

8b

(c) What fraction of the children in the class have no pets?

8c

(d) How many pets in total are owned by the boys?

8d

**[5 marks]**

Please turn over

9. When a gas meter was read in October 2010, the meter reading showed 3165 units. When it was read again, in January 2011, the meter reading was 3945.

(a) Work out how many units of gas were used in the 3 months from October to January.

9a	<input type="text"/>
----	----------------------

(b) The cost of the gas is 7p for each unit. Also there is a fixed charge of £12.50 to be paid. Work out the total cost of the gas and the fixed charge.

9b	<input type="text"/>
----	----------------------

(c) Finally, 10% of this total is then added on for tax purposes. Work out the final cost.

9c	<input type="text"/>
----	----------------------

**[5 marks]**

10. Using the fact that  $52 \times 316 = 16\,432$ , find the answers to

(a)  $5.2 \times 316$

10a	<input type="text"/>
-----	----------------------

(b)  $16\,432 \div 52$

10b	<input type="text"/>
-----	----------------------

(c)  $5\,200 \times 0.316$

10c	<input type="text"/>
-----	----------------------

(d)  $16\,432 \div 3160$

10d	<input type="text"/>
-----	----------------------

(e)  $26 \times 158$

10e	<input type="text"/>
-----	----------------------

**[5 marks]**

Please turn over

11. The table shows part of the railway timetable for trains from Andforth to Ermston. Some trains stop at stations between, and others are express trains. All stopping trains take the same time between stations as each other.

	Express	Stopping	Express	Stopping	Express	Stopping
Andforth	13:18	13:43	14:24	14:41	15:20	15:34
Bowlton		14:06		15:04		
Cheeble		14:18		15:16		
Delf		14:23		15:21		
Ermston	14:02	14:38	15:08	15:36	16:04	

- (a) How many minutes does it take to travel from Andforth to Cheeble?

11a

- (b) Complete the times in the table for the stopping train which leaves Andforth at 15:34.

- (c) How much longer does the stopping train take than the express for the journey from Andforth to Ermston?

11c

- (d) David lives in Bowlton and he wants to travel to Delf. He misses the 14:06 train by 10 minutes. How long will he have to wait for the next train?

11d

- (e) The stopping trains travel at an average speed of 36 miles per hour for the whole journey. Work out the distance from Andforth to Ermston?

11e

- (f) Work out the average speed of the express trains in miles per hour.

11f

**[10 marks]**



12. In Madd arithmetic there are only four digits, 1, 2, 3, and 4.

Here are the addition and multiplication tables for Madd arithmetic:

+	1	2	3	4
1	2	3	4	1
2	3	4	1	2
3	4	1	2	3
4	1	2	3	4

×	1	2	3	4
1	1	2	3	4
2	2	4	1	3
3	3	1	4	2
4	4	3	2	1

So, for example,  $2 + 3 = 1$  and  $3 \times 4 = 2$ .

Use the tables to find the answers to:

(a)  $3 + 3$

12a	<input type="text"/>
-----	----------------------

(b)  $4 \times 2$

12b	<input type="text"/>
-----	----------------------

(c)  $(3 \times 4) \times 2$

12c	<input type="text"/>
-----	----------------------

(d)  $(4 \times 3) + (3 \times 1)$

12d	<input type="text"/>
-----	----------------------

(e)  $m + m = 2$ . What two possible numbers could  $m$  stand for?

12e	<input type="text"/>
-----	----------------------

(f)  $u + v = u \times v$  where  $u$  and  $v$  are different numbers.  
What numbers do  $u$  and  $v$  stand for?

12f	<input type="text"/>
-----	----------------------

(g)  $t + y = y$  where  $y$  can stand for any number.  
What number does  $t$  stand for?

12g	<input type="text"/>
-----	----------------------

(h)  $(w \times w) + w = w$ . What are the two possible numbers that  $w$  could stand for?

12h	<input type="text"/>
-----	----------------------

**[10 marks]**

Please turn over

13. This is a question which needs you to be organised, and to work in a logical manner. Set your answers out clearly.

Write down

- (a) all the 3-digit numbers which can be made by using each of the digits 1, 2, and 3 once only.
- (b) all the 4-digit numbers which can be made by using each of the digits 1, 1, 2, and 2 once only.
- (c) all the 5-digit numbers which can be made by using each of the digits 1, 1, 1, 2 and 3 once only.

**END OF PAPER**

**[10 marks]**



