THE ENGLISH SCHOOL
A SECOND CENTURY OF EXCELLENCE

ENTRANCE EXAMINATIONS 2018

MATHEMATICS   FIRST FORM

Time allowed: 1 hour and 15 minutes

- Answer ALL questions.

- Show all necessary working on the question paper in the spaces provided and write your answers in the appropriate places.

- The marks for each question are given at the end of the question.

- There are 30 questions in this paper.

- The total number of marks is 100.

- If you cannot do a question, move to the next one so you do not lose time.

- **CALCULATORS ARE NOT ALLOWED**.

- **DO NOT WRITE IN THE RIGHT-HAND MARGIN.**

1. Evaluate the following:

(a) $9876 - 123 + 450$

Answer: ………………… **(2)**

(b) $182 \div 13$

Answer: ………………… **(1)**

(c) $2\dfrac{1}{6} - \dfrac{3}{4}$

Answer: ………………… **(3)**

(d) $1\dfrac{3}{5} \div 2\dfrac{2}{15}$

Answer: ………………… **(3)**

(**Total 9 marks**)

Q1

2. What fraction of the shape below is shaded?
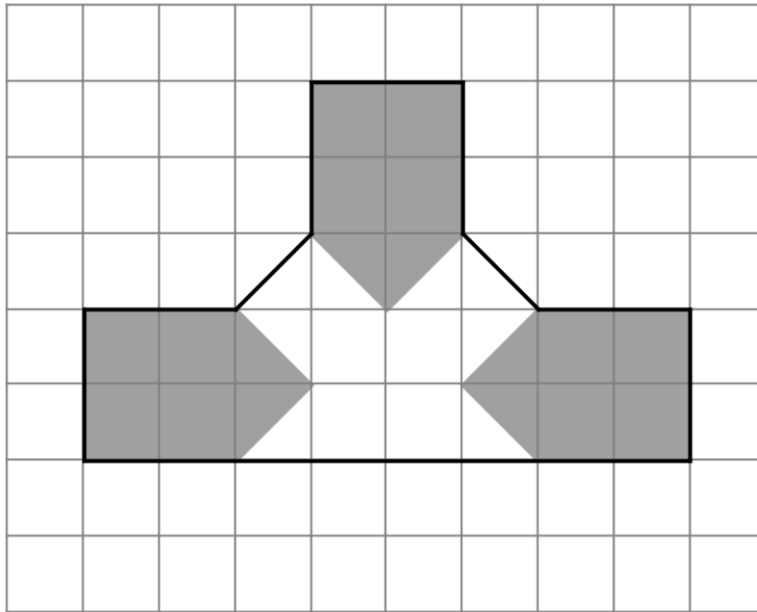
Answer: …………………. **(2)**

(**Total 2 marks**)

3. A bottle of medicine holds a quarter of a litre of medicine when full.

(a) Write this quantity in millilitres.

Answer: …………… ml **(1)**

Alex must take 5 ml of medicine three times a day for nine days.

(b) When Alex has finished taking the medicine, how many millilitres are left in the bottle?

Answer: ……………… ml **(3)**

(**Total 4 marks**)

4. Kate has 63 sweets. She keeps ⅓ for herself and shares the rest equally between her two friends Mary and Lucy.

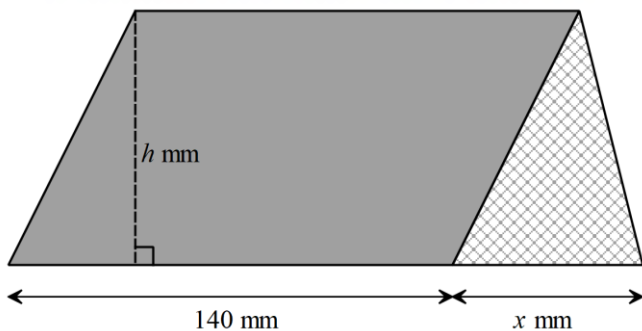Lucy then gives 3/7 of her sweets to Jill.

How many sweets does Lucy keep?

Answer: ………………… **(3)**

(**Total 3 marks**)

5. In the diagram below, the area of the parallelogram is 2800 mm². (*The diagram is not accurately drawn*)

h mm

140 mm x mm

(a) Find the length h.

Answer: $h = $ ……… mm **(2)**

The area of the triangle is 600 mm².

(b) What is the length x of the base of the triangle?

Answer: $x = $ ……… mm **(2)**

(**Total 4 marks**)

6. You are given the following nine number cards:

| 1 | 2 | 3 | 5 | 6 | 9 | 10 | 12 | 15 |

Using these number cards fill in the following table.
Each card must be used only once.

	EVEN	ODD	PRIME
MULTIPLE OF 3			
FACTOR OF 10			
FACTOR OF 18			

(3)

(Total 3 marks)

7. $\dfrac{N}{24}$ is a fraction where N is a whole number.

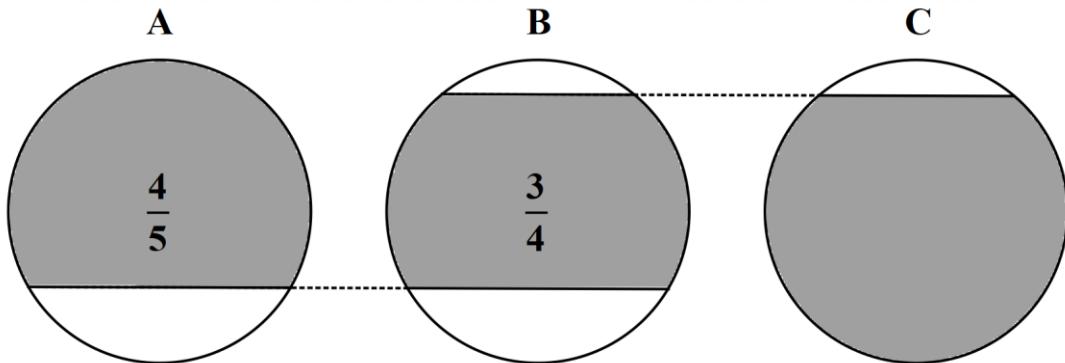How many possible values are there for N if $\dfrac{N}{24}$ is more than $\dfrac{1}{6}$ but less than $\dfrac{3}{8}$?

Answer: ………………. (2)

(Total 2 marks)

8. The diagram shows three identical shapes **A**, **B** and **C**. (*The diagram is not accurately drawn*)
Four fifths of shape **A** is shaded.
Three quarters of shape **B** is shaded.

A   B   C

$\dfrac{4}{5}$ $\dfrac{3}{4}$

What fraction of shape **C** is shaded?

Answer: ………………   **(3)**

(**Total 3 marks**)

Q8

9.

(a)   If the three-digit number 6M8 is divisible by 9, find M.

Answer: M = …………….   **(2)**

(b)   If the four-digit number 37N5 is divisible by 35, find N.

Answer: N = …………….   **(2)**

(**Total 4 marks**)

Q9

10.

(a) In the sequence below, the term to term difference is always the same.

$$6 , b , c , d , 18 , \ldots$$

Find the value of d.

Answer: $d = $ ………………… **(2)**

(b) Find the sum of the terms in the 11th pair of brackets.

$$(1 , 3) , (5 , 7) , (9 , 11) , (13 , 15) , \ldots$$

Answer: ………………… **(2)**

Q10

(Total 4 marks)

11. Find:

(a) 15% of 400

Answer: ………………… **(2)**
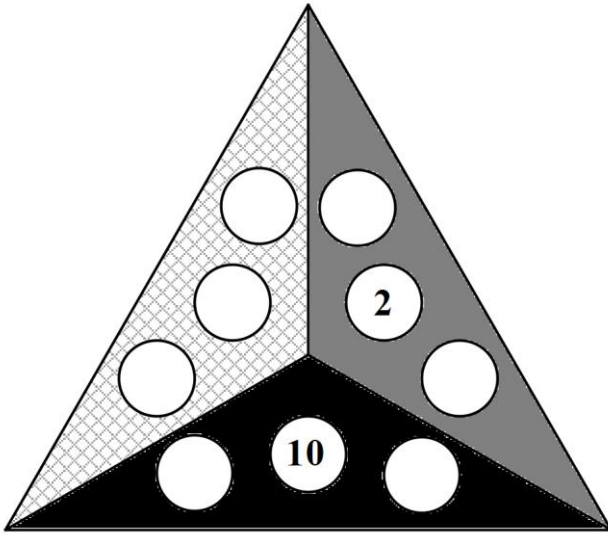
(b) $\frac{5}{16}$ of 288

Answer: ………………… **(2)**

Q11

(Total 4 marks)

12. In the puzzle below, the numbers 2 to 10 inclusive are placed in the circles so that the sum of the numbers in each shaded triangle is 18. Complete the puzzle.

(3)

(Total 3 marks)

13. Mark was in a car race that lasted 2 hours and 31 minutes.
The race started at 14:45
At what time did the race finish?

Answer: …………………   (2)

(Total 2 marks)

14. Nina buys 4 bottles of water for a camping trip.

She drinks ⅕ of one bottle. What percentage of her water supply has she drunk?

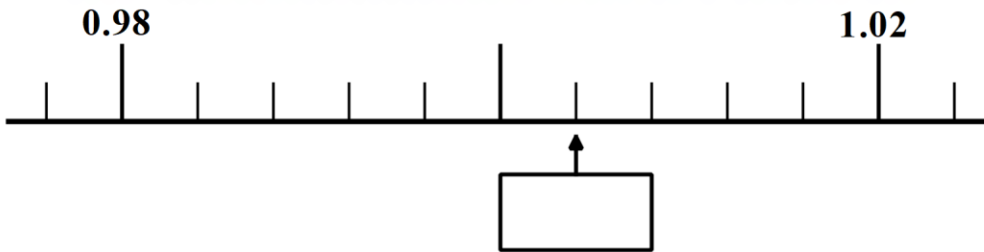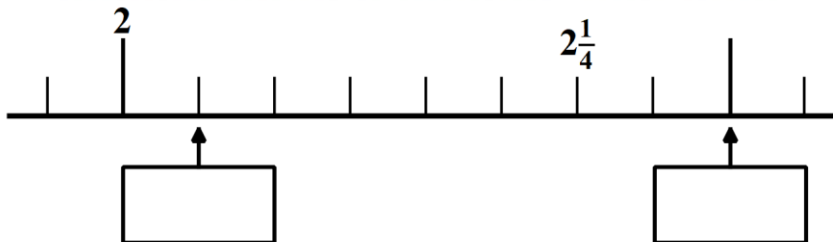Answer: ………………   (2)

(Total 2 marks)

15. Here are parts of two different number lines.
Write in each box the number indicated by the arrow.

(a)

0.98   1.02

(1)

(b)

2                          $2\frac{1}{4}$

(2)
(Total 3 marks)

16. Sarah bought 10 exercise books and 4 pencils.
Rebecca bought 4 exercise books and 10 pencils.
Sarah paid €1.20 more than Rebecca.
Pencils cost 40 cents each.
How much does an exercise book cost?

Answer: ………………cents **(3)**

(Total 3 marks)

17. The ages of ten children are 2, 3, 5, 6, 6, 7, 7, 7, 8 and 9 years.

    (a) Find their mean age?

        Answer: ………………….. **(3)**
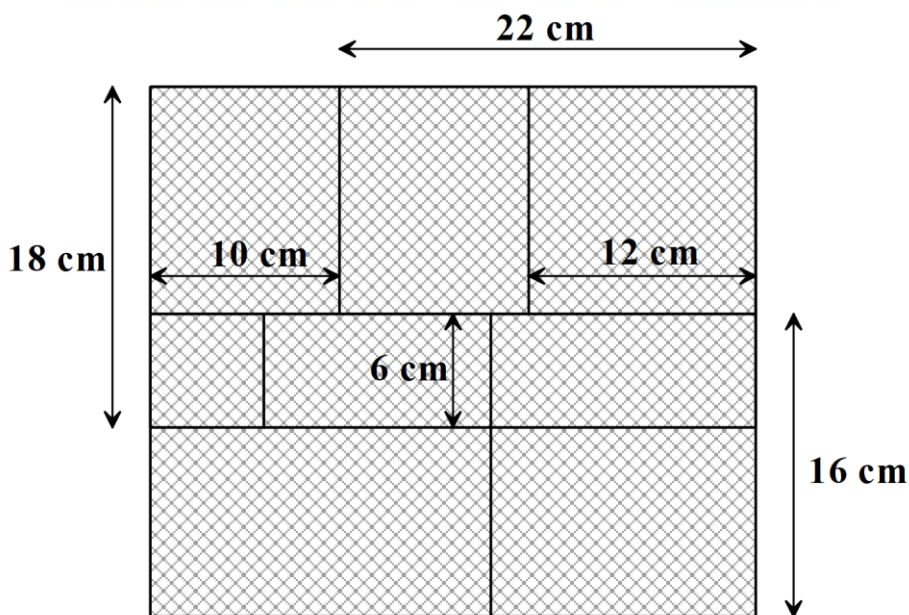
    (b) In four year's time, what will their mean age be?

        Answer: ………………….. **(1)**

        (Total 4 marks)

Q17

18. Work out the perimeter and area of this shape.
    (*The diagram is not accurately drawn*)

        Answer: ………………cm

        ………………cm^2 **(5)**

Q18

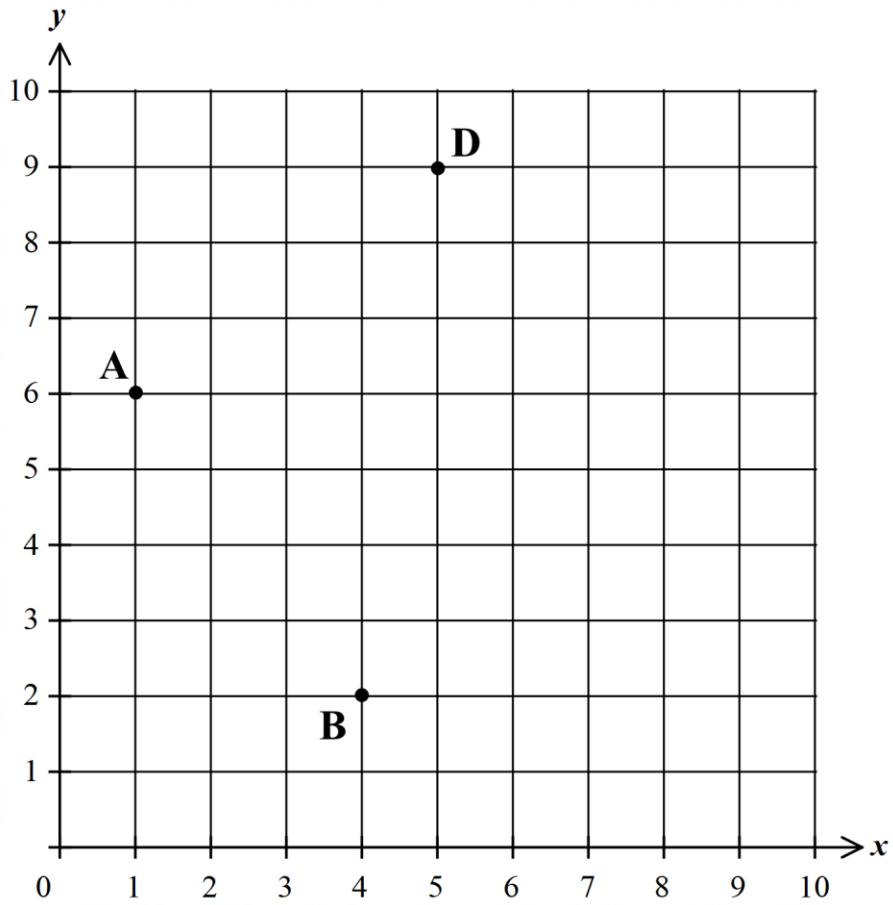   **(Total 5 marks)**

19. Points **A**, **B** and **D** have been plotted on the centimetre square co-ordinate grid below.

Point **A** has coordinates (1, 6), **B** (4, 2) and **D** (5, 9).

ABCD is a square.

(a) On the grid above, plot and label point **C**.

(1)

The area of the square **ABCD** is 25 cm^2.

(b) Calculate the perimeter of the square.

Answer: ………………cm **(2)**

(**Total 3 marks**)

11

20. Use the fact that $4.6 \times 1.3 = 5.98$, to work out:

   (a) 460×13

Answer: …………………. **(1)**

   (b) $59.8 \div 460$

Answer: …………………. **(1)**   **Q20**

(**Total 2 marks**)

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21. Ed is chasing Bruno.
They are both running on the same straight track.
Ed is running at a speed of 7.5 metres per second.
Bruno is 60 metres ahead of Ed and running at a speed of 4.5 metres per second.
How many seconds does it take Ed to catch up with Bruno?

Answer: …………………. **(3)**   **Q21**

(**Total 3 marks**)

22. Paul does the following calculation on his calculator.

$$29.82 \div 0.915$$

He gets the following digits in the display without the decimal point.
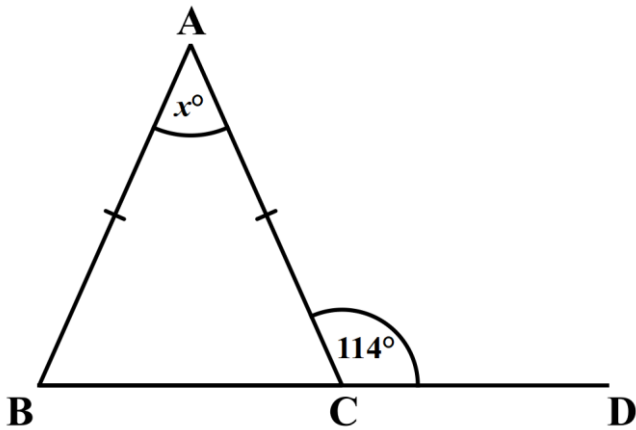
$$3259016393$$

Give the answer with the decimal point in the correct place.

Answer: …………………   **(1)**

(Total 1 mark)

23. In the diagram below, **AB** = **AC** and **BCD** is a straight line
Calculate the value of angle *x*.
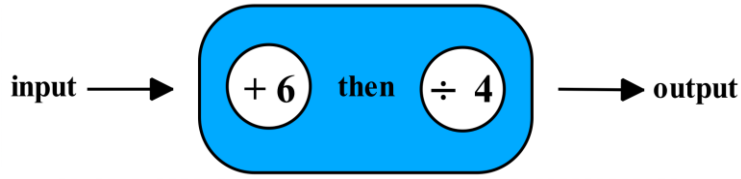(*The diagram is not accurately drawn*)

$x = $ ……………°   **(3)**

(Total 3 marks)

24. George has the two-stage number machine shown below.

input ⟶ (+ 6) then (÷ 4) ⟶ output

(a) Work out the output when the input is 14

Answer: …………………. **(1)**

(b) Work out the input when the output is 3

Answer: …………………. **(2)**

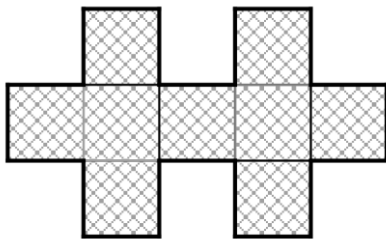When George puts a number in the machine, the same number comes out.

(c) What number did George put in?

Answer: …………………. **(1)**

Q24

(Total 4 marks)

25. This shape has a perimeter of 80 cm.
It is made from square tiles.
(*The diagram is not accurately drawn*)

Find the area of the shape.

Answer: ………………cm^2 **(4)**

Q25

(Total 4 marks)

14

26. Pizza Palace prices are shown in the table below:

Pizza size		
Small (S)	Medium (M)	Large (L)
€ 5.10	€ 8.70	€12.00

Extra toppings					
Peppers	Olives	Feta	Halloumi	Tuna	Shrimp
€ 0.25	€ 0.35	€ 0.40	€ 0.50	€ 0.60	€ 0.75

Mia orders a pizza. She asks for a medium pizza with four toppings: peppers, olives, feta and tuna.

 (a) How much does she have to pay?

Answer: …………………….   **(3)**

Claudia orders a small pizza with three different toppings.
The cost of Claudia's pizza is €6.20

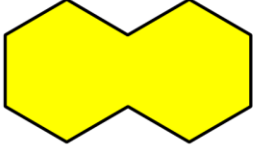 **(b)** What three toppings did Claudia order?

Answer: ………………….

………………….

………………….   **(2)**

(**Total 5 marks**)
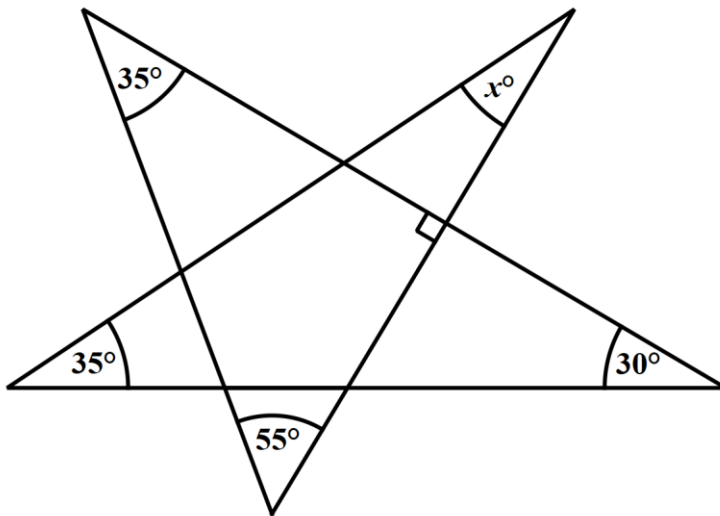
15

27. The following question is on pattern blocks.

If ⬡⬡ − (▱ + ▱) = 600, then ⬛ = ?

Answer: ………………….   (3)

(**Total 3 marks**)

28. Calculate the value of angle x. (*The diagram is not accurately drawn*)

$x =$ ……………°   (3)

(**Total 3 marks**)

29. In a restaurant, a service charge of 10% is added to the cost of a meal.
A family meal costs €42.50.

    (a) What service charge will be added to the bill for this meal?

<div align="right">Answer: €…………………. **(1)**</div>

A family gets a final bill (including the service tax) for €88.00

    (b) What was the cost of the meal?

<div align="right">Answer: €…………………. **(2)**</div>

<div align="right">**Q29**</div>

<div align="right">(**Total 3 marks**)</div>

30. Erin only has 8 cent and 12 cent stamps.
She can make a total of 92 cents by using ten 8 cent stamps and one 12 cent stamp.
Find two more ways in which she can make a total of 92 cents.
Write your answer like the example in the table below.

10 × 8 + 1 × 12 = 92 cents
1st way:
2nd way:

<div align="right">**Q30**</div>
<div align="right">**(2)**</div>

<div align="right">(**Total 2 marks**)</div>

END

TOTAL : 100 MARKS