ENTRANCE EXAMINATIONS 2017

MATHEMATICS   FIRST FORM

Time allowed: 1 hour and 30 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 34 questions in this paper.

- The total number of marks is 100.

- If you cannot do a particular question, move to the next question without losing time.

- **CALCULATORS ARE NOT ALLOWED**.

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

1. Evaluate the following:

   (a) $1234 + 567 - 890$

Answer: ………………….. **(2)**

   (b) $1071 \div 17$

Answer: ………………….. **(1)**

   (c) $\dfrac{5}{6} - \dfrac{4}{9}$

Answer: ………………….. **(2)**

   (d) $2\dfrac{4}{5} \times \dfrac{25}{28} \div 3\dfrac{3}{4}$

Answer: ………………….. **(3)** **Q1**

(**Total 8 marks**)

2. What fraction of the shape below is shaded?

Answer: …………………. **(2)**

(Total 2 marks)

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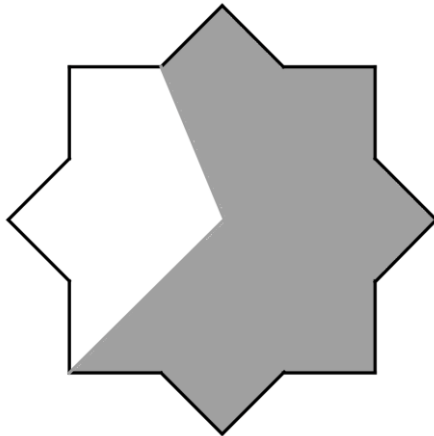
3. Zoe has a jug of capacity 1.75 litres which is full of lemonade.
She has nine cups each of capacity 150 ml.
Zoe fills the cups with lemonade from her jug.

(a) What volume of lemonade is left in the jug?
Give your answer in ml.

Answer: …………… ml **(2)**

Zoe has eight 2 litre bottles of lemonade.

(b) How many times could Zoe completely fill her jug from these bottles?
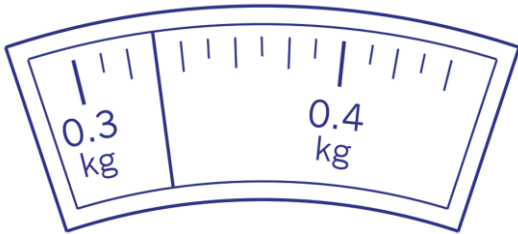
Answer: ………………. **(2)**

(Total 4 marks)

4.   In a box of shapes there are three times as many squares as there are circles.
There are twice as many triangles as squares.
If there are 45 squares, how many shapes are there altogether?

Answer: ………………   **(2)**

(Total 2 marks)

5.   The scale shows the weight of a parcel, in kg.

What does the parcel weigh in grams?

Answer: …………………. g **(2)**

(Total 2 marks)

6.   A ball costs €19.49
How much change do you get if you pay only with 20 cent coins?

Answer: ,………… cents   **(2)**

(Total 2 marks)

7. Cameron has the following five number cards.

$$\boxed{1} \quad \boxed{2} \quad \boxed{3} \quad \boxed{4} \quad \boxed{5}$$

The cards can be placed together to form a number. For example, using three of his cards Cameron can create the smallest 3-digit multiple of 3.

$$\boxed{1} \quad \boxed{2} \quad \boxed{3}$$

In the questions that follow, choosing from Cameron's cards, write numbers on the blank cards to make:

(a) the smallest possible 3-digit multiple of 6,

$$\boxed{} \quad \boxed{} \quad \boxed{}$$

(1)

(b) the largest possible 2-digit prime number,

$$\boxed{} \quad \boxed{}$$

(1)

(c) the largest possible 4-digit multiple of 5.

$$\boxed{} \quad \boxed{} \quad \boxed{} \quad \boxed{}$$

(1)

Q7

(Total 3 marks)

5

8. You are given the sequence 2, 6, 10, 14, …

The 50th term in this sequence is 198.
Find the 60th term.

Answer: ……………… **(2)**

(Total 2 marks)

9.

(a) The numbers 7, 8 and 9 are consecutive. Their sum is 24.
Find three consecutive numbers whose sum is 147.

Answer: ……………… **(2)**

(b) Find the fraction that lies exactly half way between $\dfrac{3}{16}$ and $\dfrac{1}{4}$.

Answer: ……………… **(2)**

(Total 4 marks)

10. In a magic square, the sum of the numbers in each row, each column and each diagonal is the same. Write numbers in the empty squares to complete this magic square.

1			4
12		6	9
8	11	10	5
	2	3	

(2)

Q10

(Total 2 marks)

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11. Erin bought 2 cakes and a doughnut for €3.90
Sue bought 3 cakes and 2 doughnuts for €6.40
How much is one doughnut?

Answer: ………………….   **(3)**

Q11

(Total 3 marks)

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12. What is the value of

$$\frac{66+77+88+99}{11+22+33+44}$$

Answer: ………………….   **(2)**

Q12

(Total 2 marks)

7

13. Each symbol below represents a single digit number.
Given that the following statements are true, work out the value of each symbol.

$$\triangle \times \bigcirc \times \bigcirc = \triangle \square$$

$$\triangle \times \square = \square$$

$$\triangle = \text{........}$$

$$\bigcirc = \text{........}$$

$$\square = \text{........}$$

(3)

(**Total 3 marks**)

14. Belinda earns €450 a week and spends 20% of this on rent.

(a) How much is her rent?

Answer: €………………… **(1)**

Brian earns €380 a week and spends ¼ of this on rent.

(b) What is the difference in their rents?

Answer: €………………… **(2)**

(**Total 3 marks**)

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

(a)

0.105   0.107

(1)

(b)

7          $7\frac{1}{3}$

(2)
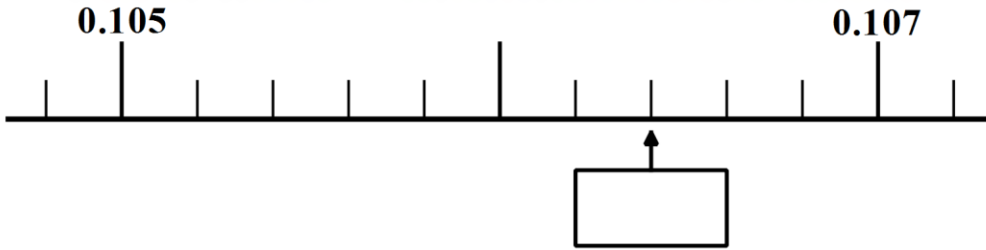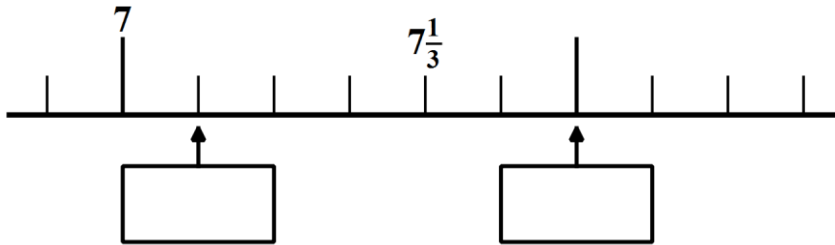
(Total 3 marks)

16. Two barrels of equal size contain oil.
One of the barrels is full and the other is half full.
Their masses are 82 kg and 50 kg.
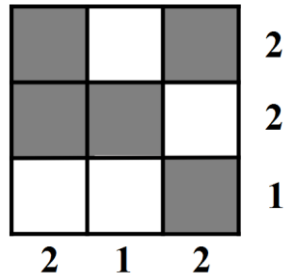What is the mass of an empty barrel?
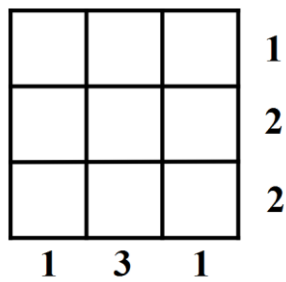
Answer: ……………… kg   **(2)**

(Total 2 marks)

17. In the grid below, each number at the end of a row or underneath a column indicates how many squares are shaded in that row or column.

Complete the gird given below.

(2)

Q17

(Total 2 marks)

18. Stephanie thinks of a two-digit number.
When she divides this number by four the remainder is 2.
When she divides this number by five the remainder is again 2.
When she divides this number by six then there is no remainder.
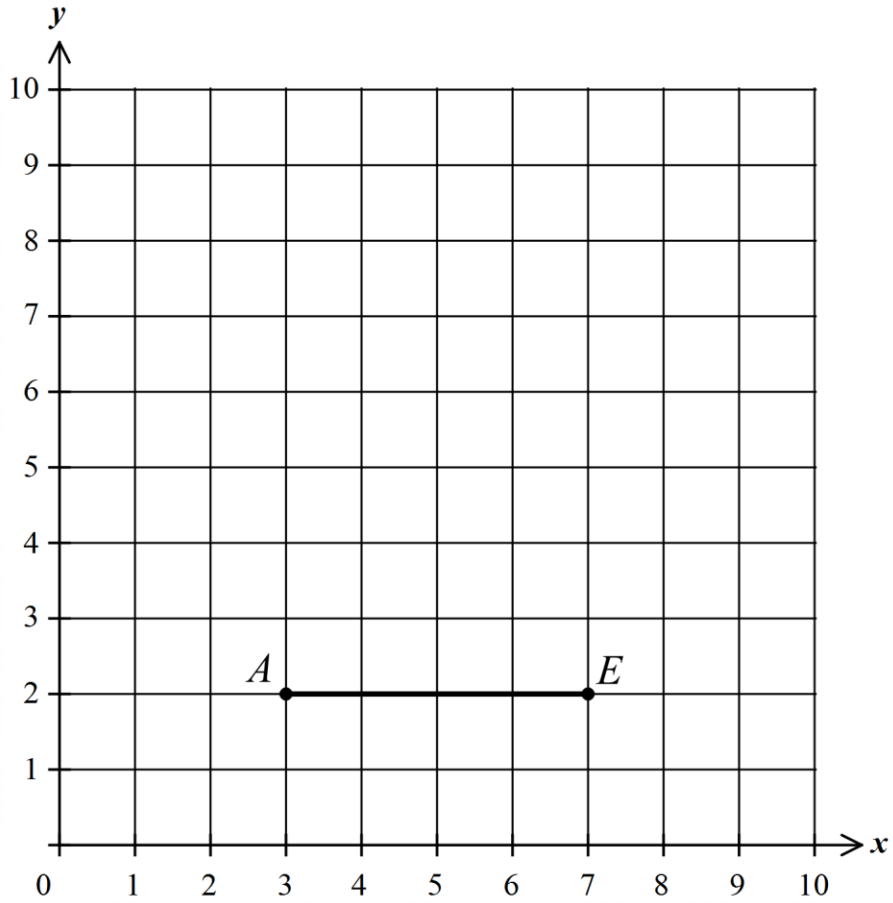Which is Stephanie's number?

Answer: ………………….   (2)

Q18

(Total 2 marks)

19. Points A and E have been plotted on the centimetre square co-ordinate grid below.

Point A has coordinates (3, 2), E (7, 2), K (3, 4), M (6, 5) and N (5, 8).

(a)   On the grid above, plot and label points K, M, and N.

(2)

$KMNP$ is a square.

(b)   On the grid above, plot and label point P.

(1)

AE is the longer diagonal of rhombus $ABEZ$ which has an area of 4 cm^2.

(c)   On the grid above plot the points B and Z and draw the rhombus $ABEZ$.

(1)

(Total 4 marks)

20. Use the fact that $335 \times 124 = 41540$, to work out:

(a) 3.35×1.24

Answer: ………………….. **(1)**

(b) $41540 \div 33.5$

Answer: ………………….. **(1)**
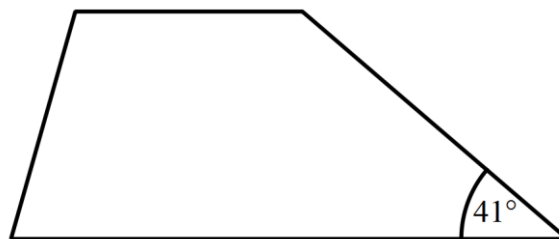
(c) 33.5×62

Answer: ………………….. **(1)**

(**Total 3 marks**)

Q20

21. One of the angles in a trapezium is 41°.

Find the sum of the three remaining angles.
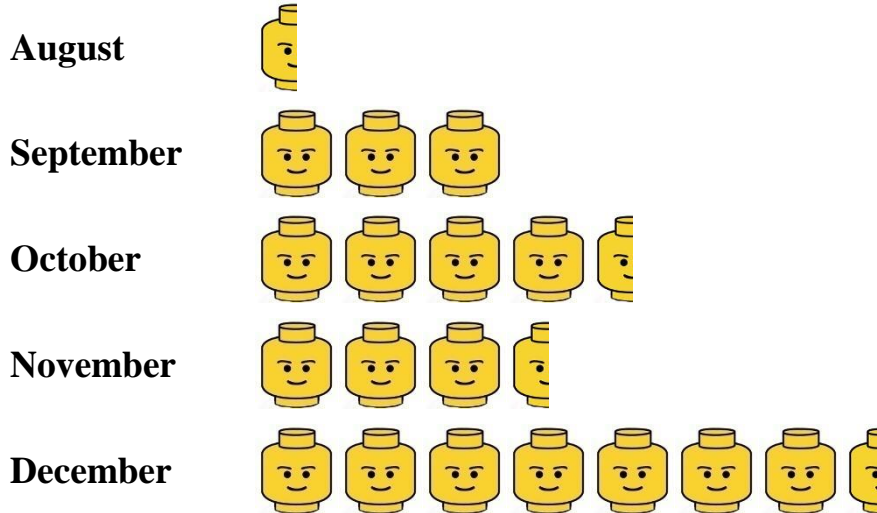(*The diagram is not accurately drawn*)

…………… **(2)**

(**Total 2 marks**)

Q21

22. The pictogram gives information about the numbers of LEGO sets sold by a shop in the last five months of 2016.

August

September

October

November

December

(a) If in October, 90 LEGO sets were sold, then:

=

(1)

(b) How many LEGO sets were sold in total in these 5 months

Answer: …………………. (2)

(**Total 3 marks**)
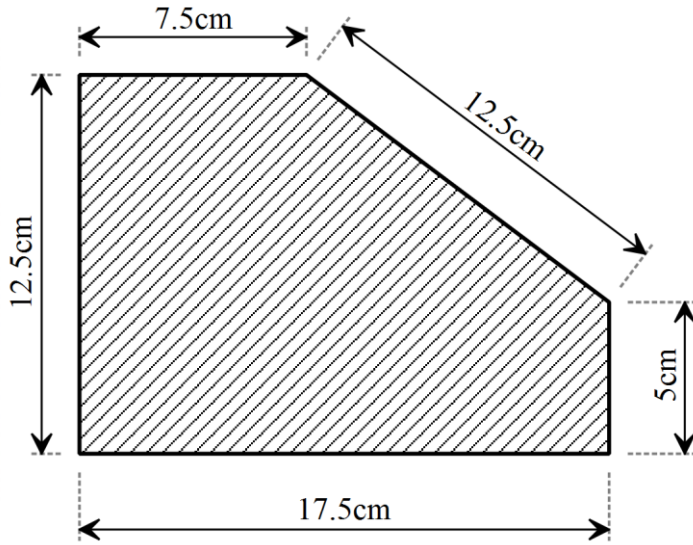
23. Find:

(a) 65% of 200

Answer: …………………. (2)

(b) $\frac{3}{7}$ of 385

Answer: …………………. (2)

(**Total 4 marks**)

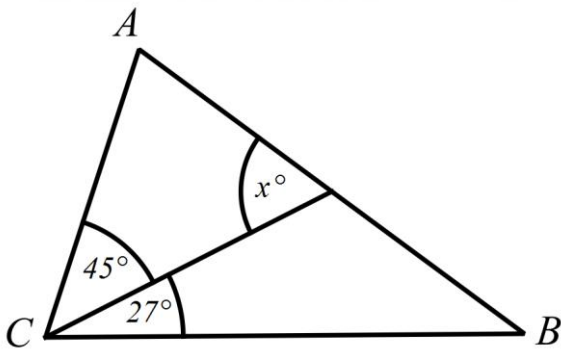**24.** Work out the area of this shape. (*The diagram is not accurately drawn*)

7.5cm

12.5cm

12.5cm

5cm

17.5cm

Answer: ………………cm^2 **(3)**

(Total 3 marks)

25. In the diagram below, **AB = BC**.
Calculate the value of angle *x*.
(*The diagram is not accurately drawn*)
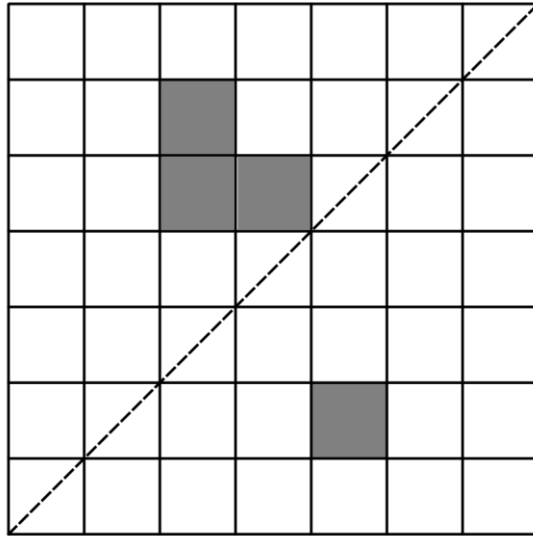

A

x°

45°

27°

C

B

x = …………… **(3)**

(Total 3 marks)

14

26. Shade the smallest number of squares required to make the dotted line shown a line of symmetry.
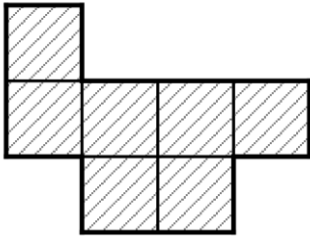

(2)

(Total 2 marks)

27. This shape has an area of 112 cm^2.
It is made from square tiles.
(*The diagram is not accurately drawn*)

Find the perimeter of the shape.

Answer: ………………cm   **(3)**

(Total 3 marks)

15

28. A number machine works to the rule

'cube each digit and then add the cubes together'.

For example:

Input 37 gives output 370:

$$3^3 + 7^3 = 27 + 343$$
$$= 370$$

Input 121 gives output 10:

$$1^3 + 2^3 + 1^3 = 1 + 8 + 1$$
$$= 10$$

(a) Work out the output for input 25

Answer: ………………… **(2)**

(b) What three-digit input would give output 3?

Answer: ………………… **(1)**

Input 153 gives output 153.

(c) Which two numbers between 300 and 400 will also give output 153?

Answer: …….. and ……... **(2)**

Q28

(Total 5 marks)

29. The following question is on pattern blocks.

If ⬡ + ▱ = 45, then ▱ = ?

Answer: ………………… **(2)**

Q29

(Total 2 marks)

16

30. The average age of 9 athletes is 19 years 2 months.
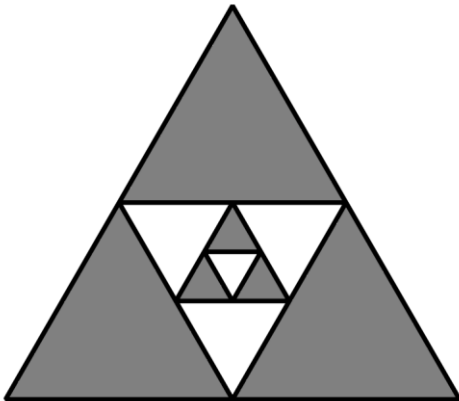The average age of the athletes and their coach is 21 years.
How old is the coach?

Answer: …………………   **(3)**

(Total 3 marks)

31. All the triangles below are equilateral.
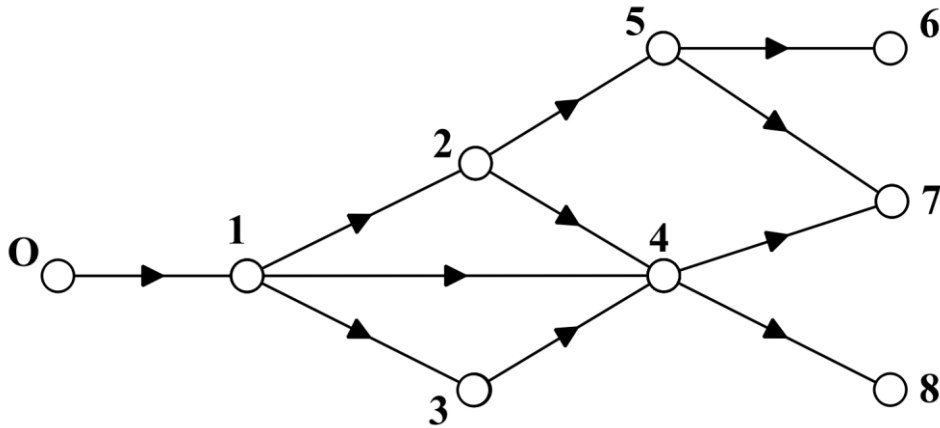The large triangle has an area of 128 cm^2.

Find the total area of the grey triangles.

Answer: ………………cm^2 **(3)**

(Total 3 marks)

32. Some marbles are released through this network from **O**. At each of the junctions, an equal number of the marbles flows in each direction, unless there is only one direction to follow.

(a) What fraction of the marbles goes towards junction **2**?

Answer: …………………. **(1)**

(b) What fraction of the marbles goes towards junction **8**?

Answer: …………………. **(2)**

(**Total 3 marks**)

33. Liz started to write the whole numbers starting from 1.
When she has written down the 189th digit she has just written the number 99.
She is now writing the 2893rd digit. Which whole number is she writing?

Answer: …………………. **(2)**

(**Total 2 marks**)

34. Paul has two counters, with different whole numbers on each side. He throws them once and adds the numbers he sees:

$$6 \quad + \quad 7 \quad = \quad 13$$

Paul throws his counters several more times and gets the following totals:

9, 11, 15

(a) What number is on the other side of the black counter?

Answer: ………………. **(1)**

(b) What number is on the other side of the grey counter?

Answer: …………………. **(1)**

Alex gives Paul a third counter.
When Paul throws all three counters together he can get the following totals:

10, 12, 13, 14, 15, 16, 17 & 19.

(c) What are the two numbers on the third counter?

Answer: …….. and …….... **(2)**

END

(Total 4 marks)

TOTAL FOR PAPER: 100 MARKS