ENTRANCE EXAMINATION 2020

MATHEMATICS – YEAR 1

Time allowed: 1 hour and 15 minutes

General Instructions:

- Answer ALL questions in your question paper.
- 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 mark 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**

GOOD LUCK!

1. Fill in the missing numbers in the boxes

(a) $530 - \boxed{} = 202$

(b) $\boxed{} \times 3 \times 2 \times 1 = 54$

(c) $125 \times 4 = 1000 \div \boxed{}$

(d) $0.75 \div 1\dfrac{3}{4} = \boxed{}$

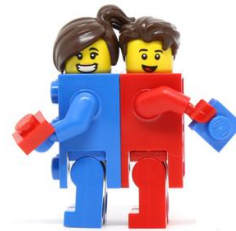**(e)** $5 + \left(5 \div \left(5 + 5\right)\right) = \boxed{}$

(Total 9 marks)

2. 40% of the children on a school trip are boys and there are 72 girls.

How many children are on the trip?

Answer: …………………………… children **(2)**

(Total 2 marks)

3. The table below shows successive calculations that appear on the screen of a pocket calculator and the final answer.

What was the original number?

Original number	...
	+ 20
	...
	÷5
	...
	x 3
Final answer	132

Answer: …………………………… **(3)**
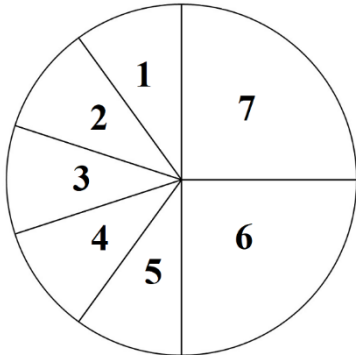
(Total 3 marks)

4. Half of the circle below is cut in 5 equal pieces which are numbered 1 to 5.
The other half of the circle is cut in 2 equal pieces which are numbered 6 and 7.

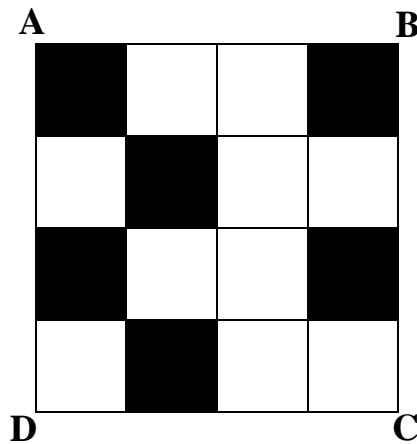What percentage of the circle is represented by odd numbers?

Answer: …………………… % **(3)** **Q4**

(Total 3 marks)

5. In the rectangle below shade the minimum number of boxes such that the diagonal BD is a line of symmetry.

(2) **Q5**

(Total 2 marks)

3

6. Mr Simon bought twelve doughnuts for €17.40.

(a) Find the cost of one doughnut.

Answer: € …………………… **(2)**

The doughnut seller is offering customers a special deal:

Twelve doughnuts for €9.45

(b) How much will Mr Simon save when he gets twelve doughnuts with this deal?

Answer: € …………………… **(2)** Q6

(**Total 4 marks**)

7. A barrel weighs 34 kg when it is empty and 58 kg when it is full.

How much will it weigh when $\dfrac{2}{3}$ is full.

Answer: …………………… kg **(3)** Q7

(**Total 3 marks**)

8. (a) Which number is nearer to 1?

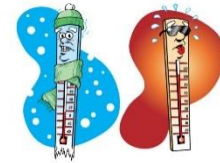$\frac{5}{4}$ $\frac{1999}{1000}$ 1.001   101% $\frac{799}{800}$

Answer: …………………… **(2)**

(b) Write all the numbers which go in the shaded box?

	factors of 55	factors of 70
< 10	1, 5	1, 2, 5, 7
prime	5, 11	

Answer: ……………………………… **(2)**   **Q8**

(Total 4 marks)

5

9. On Christmas Eve, the temperature in Cold City was $-12°C$.
At the same time, the temperature in Tropical Town was $20°C$.

(a) How many degrees hotter was the temperature in Tropical Town than in Cold City?

Answer: ……….………………… $°C$ **(1)**

By Christmas Day, the temperature in Cold City has risen by $5°C$

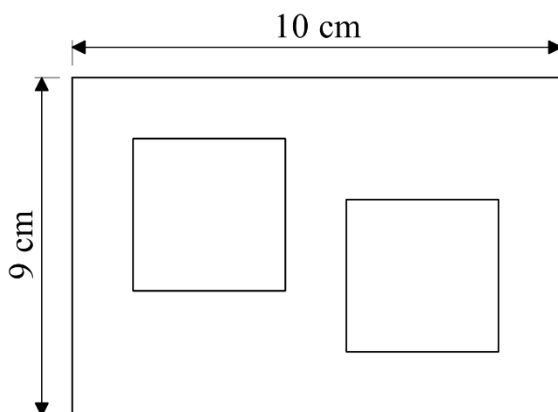(b) What was the temperature in Cold City on Christmas Day?

Answer: ……….………………… $°C$ **(1)** Q9

(Total 2 marks)

10. Two identical square holes are cut from a rectangular sheet leaving an area of 58 square centimetres.
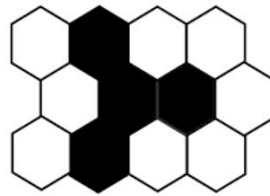
How long are the sides of the square?

(*the diagram is not drawn to scale*)

Answer: ……….………………… cm **(3)** Q10

(Total 3 marks)

6

11.

(a) What fraction of the above design is shaded? Give your fraction in its simplest form.

Answer: ……………………………… **(1)**

(b) How many more of the hexagons need to be shaded so that $\frac{3}{4}$ of the design is shaded?

Answer: ……………………………… **(1)**   **Q11**

(Total 2 marks)

12.

| 8 | 3 | 5 | 4 | 9 |

Using all these digits once only make

(a) The largest number

| | | | | |

(b) The largest number divisible by 4

| | | | | |

(c) The smallest even number

| | | | | |

(3)   **Q12**

(Total 3 marks)

13. A coach left the station in London 5 minutes late, at 13:45, and arrived in Cambridge 14 minutes early, at 15:50. How long should the journey have taken if the coach had left and arrived on time?

Answer: ……………………………… (2)

(**Total 2 marks**)

14. In a sponsored walk

- Adam took 4 hours and 39 minutes

- Bill took 274 minutes

- Charlie took $4\frac{3}{5}$ hours
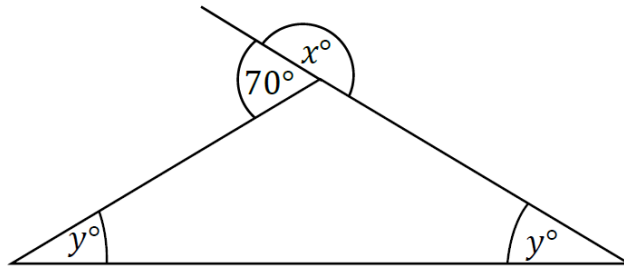
Who was the quickest and who was the slowest?

Answer: quickest ……………………

slowest …………………… (4)

(**Total 4 marks**)

15. The diagram shows a triangle and a line. The two angles marked $y°$ are equal.

(*the diagram is not drawn to scale*)

(a) Write down the value of x .

Answer: ……….………………… ° **(1)**

(b) Work out the value of y .

Answer: ……….………………… ° **(2)** **Q15**

(Total 3 marks)

16. Look at the number pattern below:

$$1^2 \; + \; 3 \; = \; 4$$
$$2^2 \; + \; 5 \; = \; 9$$
$$3^2 \; + \; 7 \; = \; 16$$

(a) Fill in the next line of the pattern

…..… + …..… = …..…

(2)

(b) Complete the following line which comes later in the pattern

…..… + …..… = 121

(2) **Q16**

(Total 4 marks)

9

17. A large barrel contains 3.25 litres of water.

Melanie fills three 500ml container from the barrel.

She uses all the rest of the water to fill as many 150ml cups as she can.

What is the largest number of cups which Melanie can completely fill?

Answer: …………………… cups **(3)**

(Total 3 marks)

18. A shopkeeper buys a box of 60 apples for €12.

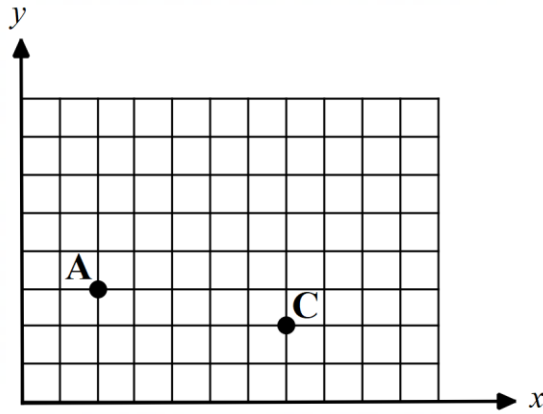He finds that $\dfrac{1}{10}$ of the apples are bad and can't be sold.

At what price must he sell each of the good apples so that he makes a profit of €15?

Answer: € …………..……………… **(4)**

(Total 4 marks)

10

19.

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

(a) Write down the coordinates of the point **C**.

Answer: (……… , ………) **(1)**

(b) Mark on the diagram the point **B** which is (5,5) .   **(1)**

(c) Write down the coordinates of point **D** so that **ABCD** is a square.

Answer: (……… , ………) **(1)**   **Q19**

(Total 3 marks)

20. Place the numbers below on the number line.

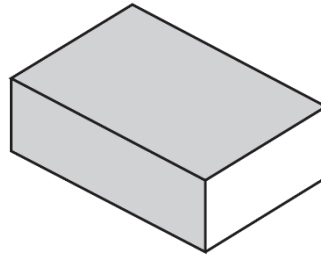$$\frac{4}{5} \qquad 0.4 \qquad \frac{25}{100}$$

(3)   **Q20**

(Total 3 marks)

21. A matchbox measures 5 cm long, 3 cm wide and 1 cm high.

(a) What is the **maximum** number of matchboxes that could fit, in one layer, onto a tray that is 20 cm long and 15 cm wide?

Answer: ……….………………… **(2)**

(b) What is the maximum number of matchboxes that could be fitted into a box measuring 25 cm by 18 cm by 10 cm?

Answer: ……….………………… **(3)** Q21

(Total 5 marks)

22. (a) Calculate $207207 \div 207$

Answer: ……….……………… **(1)**

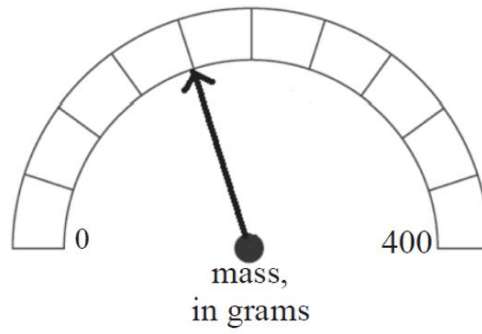(b) Jen correctly worked out that $2793 \div 49 = 57$.

Using Jen's calculation, find the value of $(49 \times 57) + 7$.

Answer: ……….………………… **(2)** Q22

(Total 3 marks)

23. What mass is shown on the scale below?

0   400

mass,
in grams

Answer: …………..……………… g **(2)** Q23

(Total 2 marks)

24. Paddy is leading in a race. He is 81 metres in front of Sam who is in last place.

Martin is between Paddy and Sam. Martin is 40 metres from the finish line and is twice as far away from Sam as he is from Paddy.

How far has Sam left to run to the finish line?

Answer: …………..……………… m **(4)** Q24

(Total 4 marks)

25. Lollipops cost 12cents each, or a pack of 3 costs 30cents.
I have €2 to spend.
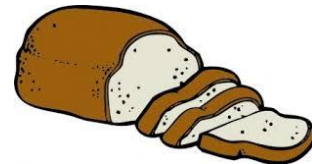
What is the maximum number of lollipops I can buy?

Answer: ………….………………. lollipops **(3)** Q25

(Total 3 marks)

26. Every 100g of brown bread contains 34g of carbohydrates.
A small loaf of brown bread weighs 500g and has 10 equal slices.

How many grams of carbohydrates are there in one slice?

Answer: ………….………………. g **(2)** Q26

(Total 2 marks)

27. Each of the following statements is false!
In each statement, **at least one zero has been missed out**.
Adapt each statement by inserting the smallest possible number of zeros to make it true.

(a) $52 + 41 = 543$

Answer: …..…..… + …..…..… = …..…..… **(1)**

(b) $32 - 114 = 2096$

Answer: …..…..… − …..…..… = …..…..… **(2)**   **Q27**

(Total 3 marks)

28. Mrs. Martha brought a basket with strawberries to give to her students in class.
If she gives 8 strawberries to each student there is none left.
If she gives 6 strawberries to each student, then 28 are left.

(a) Find the number of students in the class.

Answer: …………..……………… students **(2)**

(b) How many strawberries did Mrs. Martha have in her basket?

Answer: …………..……………… strawberries **(2)**   **Q28**

(Total 4 marks)

15

29. The symbol $\oplus$ has a special meaning in arithmetic.

   $a \oplus b$ means add a and b and then multiply by a

For example:
$$4 \oplus 2 = 4 \times (4 + 2)$$
$$= 4 \times 6$$
$$= 24$$

(a) Work out
   (i) $3 \oplus 2$

Answer: ……….………….……… **(1)**

   (ii) $4 \oplus (3 \oplus 2)$

Answer: ……….………….……… **(1)**

(b) Work out the value of p such that $6 \oplus p = 78$
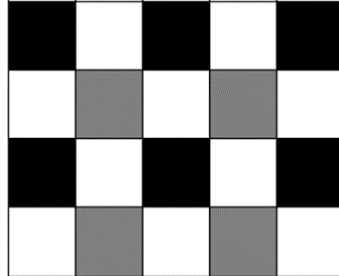
Answer: ……….………….……… **(2)** Q29

(Total 4 marks)

16

30. The diagram shows how a rectangle, 5 tiles by 4 tiles, covered with black, white and grey tiles.
There is always a black tile in the top left corner of the rectangle.

Rows and columns consist successively of alternating black and white tiles and alternating grey and white tiles.

(a) Complete the table below with the number of tiles required to cover each rectangle (the above rectangle has been completed for you)

Size of Rectangle	Black	Grey	White
5 tiles by 4 tiles	6	4	10
6 tiles by 4 tiles	6		
10 tiles by 5 tiles		10	

(2)

(b) A rectangle requires 77 black tiles and 60 grey tiles.
How many white tiles does it require?

Answer: …………..……………… white tiles **(1)**

(c)   Give one possible size of a rectangle which requires 8 grey tiles?

Answer: …………..……………… **(1)** Q30

(Total 4 marks)

TOTAL: 100 MARKS

END

17