ENTRANCE EXAMINATION 2023

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.

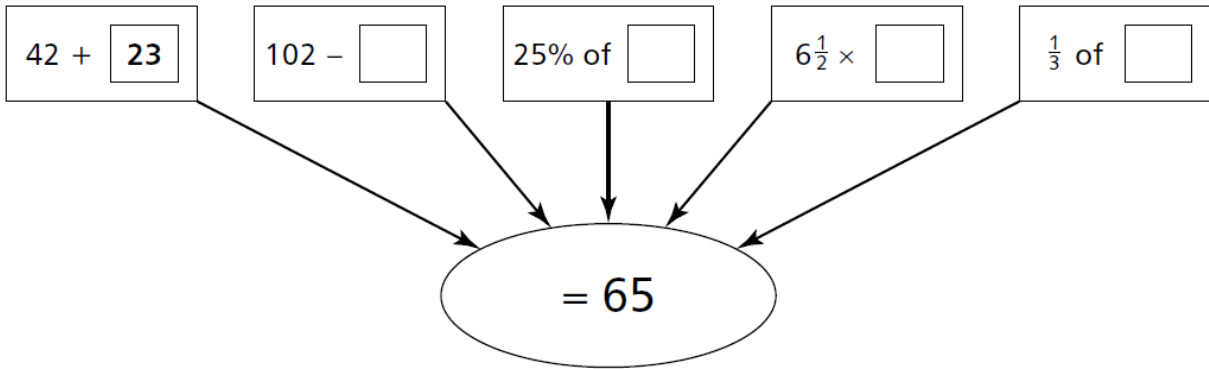- If you cannot do a question, move to the next one so you do not lose time.

- **CALCULATORS ARE NOT ALLOWED**

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

GOOD LUCK!

1. Fill in the missing numbers so that the answer is always 65.
One example is done to help you.

| 42 + **23** | 102 − ☐ | 25% of ☐ | $6\frac{1}{2} \times$ ☐ | $\frac{1}{3}$ of ☐ |

$$= 65$$

(4) Q1

(Total 4 marks)

2. Circle the number below that has the closest value to 2

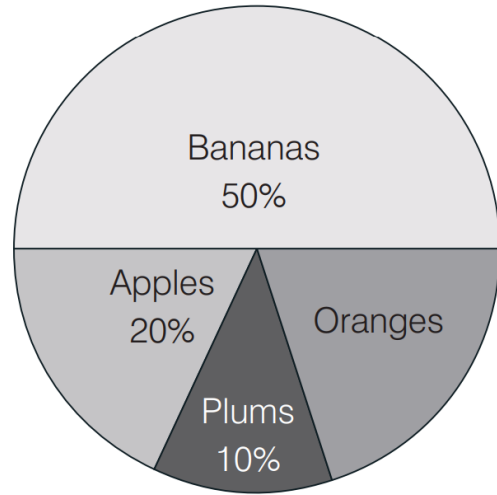$1\frac{19}{25}$ 172.8%   1.73   172.9% $1\frac{19}{26}$

(2) Q2

(Total 2 marks)

1

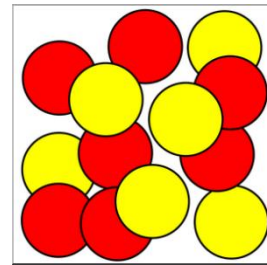**3.** 420 shoppers are asked about their favourite fruit.
How many like oranges?

Answer: …………….………………… people **(3)**

(Total 3 marks)

4. The ratio of blue to green to red counters in a box is 2:5:9

There are 84 more red counters than blue counters in the box.
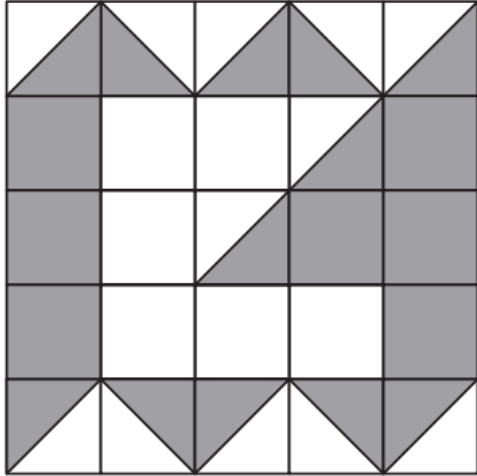
How many green counters are in the box?

Answer: …………….………………… green counters **(3)**

(Total 3 marks)

2

5. What percentage of this shape is shaded?

Answer: …………………………… % **(2)** Q5

(Total 2 marks)

6. A plant grows 0.025 m every 6 months.
It is 1.5 m tall. How many years will it take to reach 2 m?

Answer: ……………………………… years **(3)** Q6

(Total 3 marks)

7. Find the value of the following, giving your answer as a fraction in its simplest form.

$$\left(\frac{1}{25} \div \frac{1}{5}\right) \times \left(4 + 2\frac{1}{4}\right) \div 5$$

Answer: ……………………………… **(3)** Q7

(Total 3 marks)

3

8. Put the numbers 1 to 9 in the boxes below, using each number only once, to make the horizontal and vertical multiplications correct.
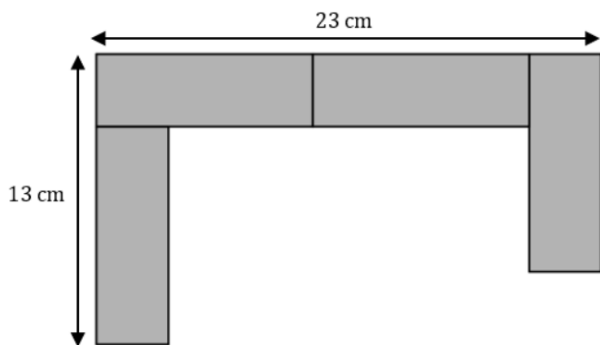
$$\boxed{} \times \boxed{} \times \boxed{} = 15$$

$$\times \qquad\qquad \times \qquad\qquad \times$$

$$\boxed{} \times \boxed{} \times \boxed{} = 144$$

$$\times \qquad\qquad \times \qquad\qquad \times$$

$$\boxed{} \times \boxed{} \times \boxed{} = 168$$

$$= \qquad\qquad = \qquad\qquad =$$

$$32 \qquad\qquad 70 \qquad\qquad 162$$

(3) **Q8**

(Total 3 marks)

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9. A pattern is made using identical rectangles, as shown.
What is the length and width of the rectangle?

23 cm

13 cm

(*The diagram is not drawn to scale*)

Answer: Width …………… cm Length …………… cm (3) **Q9**

(Total 3 marks)

4

10. Michael is now the age that Philip was three years ago.
If the sum of their ages is 43, how old will Philip be in two years?

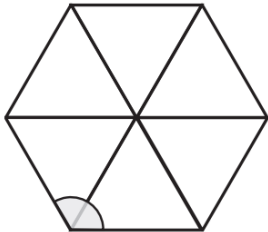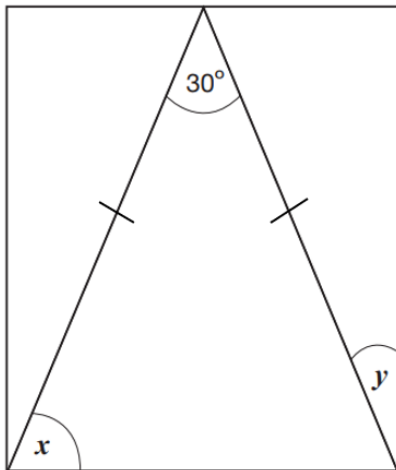Answer: ……………………………… (3)

(Total 3 marks)

11. (a) Aliki arranges 6 equilateral triangles to make the shape shown.
What is the size of the shaded angle?

(*The diagram is not drawn to scale*)

Answer: ……………………………… ° **(2)**

(b) Here is an isosceles triangle inside a rectangle. Calculate the sizes of angles *x* and *y*.

30°

y

x

(*The diagram is not drawn to scale*)

Answer: *x* = ……………………………… °

y = ……………………………… ° **(3)**

(Total 5 marks)

12. (a) Write $\dfrac{3}{8}$ as a percentage.

Answer: ………….……………… % **(1)**

(b) What does 4^5 equals? Circle the correct answer.

$\quad\quad$ 45 $\quad\quad$ 5×5×5×5 $\quad\quad$ 4×4×4×4×4 $\quad\quad$ 4×5 $\quad\quad$ 54

(1)

(c) If $72 \times 9 = 648$, complete the box

$18 \times \boxed{} = 648$

(1)

(d) Match the letters $\alpha, \beta, \gamma, \delta$ with the numbers 2, 5, 6, 8 to form fractions that have a sum $\dfrac{23}{24}$.

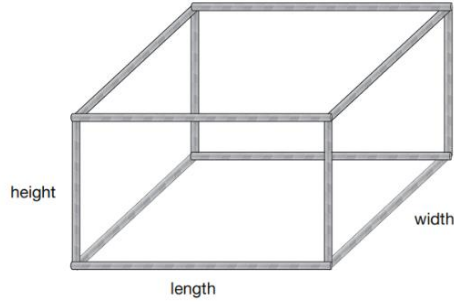$$\frac{a}{\beta} + \frac{\gamma}{\delta} = \frac{23}{24}$$

Answer: α = ……………, β = ……………, γ = ……………, δ = …………… **(2)**

Q12

(Total 5 marks)

13. Anna makes a cuboid model using straws.

She uses straws that are 7.5 cm long for the height.
She uses straws that are 11 cm long for the length.
She uses straws that are 8.5 cm long for the width.

height

width

length

(a) What is the total length of all the straws in her model?

Answer: ………….………………… cm **(3)**

(b) What is the volume of the model?

Answer: ………….………………… cm^3 **(2)** **Q13**

(Total 5 marks)

14. In a bag of money to take to the bank I have only 5 cent, 10 cent and 20 cent coins.
I have twice as many 20 cent coins as 10 cent coins and half as many 5 cent coins as
10 cent coins. If the bag contains €15.75, how many 20 cent coins are there?
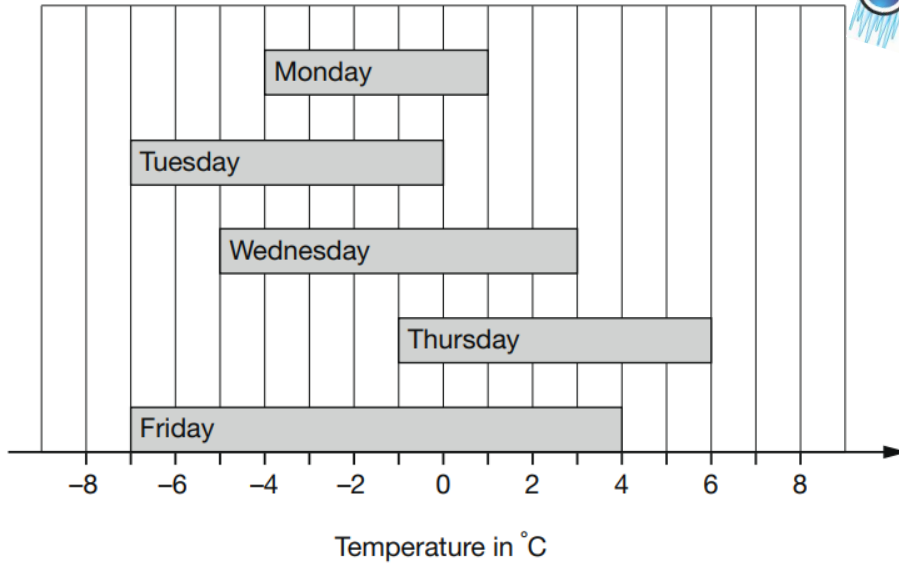
Answer: ………….………………… 20 cent coins **(3)** **Q14**

(Total 3 marks)

7

15. This chart shows the range of temperatures each day during one week from Monday to Friday.

Temperature in °C

(a) What was the lowest temperature?

Answer: ……….…………….…… °C **(1)**

(b) What was the difference between the highest and lowest temperatures on Wednesday?

Answer: ……….…………….…… °C **(2)**

Q15

(Total 3 marks)

16.

Museum ticket prices

Adults: €8

Children: half the adult price

Buy 10 child tickets and receive 1 adult ticket free.

If 17 children and 3 adults visit the museum, what is the total cost of their tickets?

Answer: € ……….…………….…… **(2)**

Q16

(Total 2 marks)

8

17. (a) Find the largest odd number that when multiplied by an even number give a product of 420.

Answer: …………..……………… **(2)**

(b) Stella has a combination lock.
The code is made up of 4 different digits *a b c d* chosen from the numbers 1 to 9.

Stella uses the following rules to make her code:

• *a* is a multiple of 4

• *b* is a square number

• *c* is odd

• *d* is a multiple of 3

(i) What is the biggest 4-digit code Stella could make?

Answer: …………..……………… **(1)**
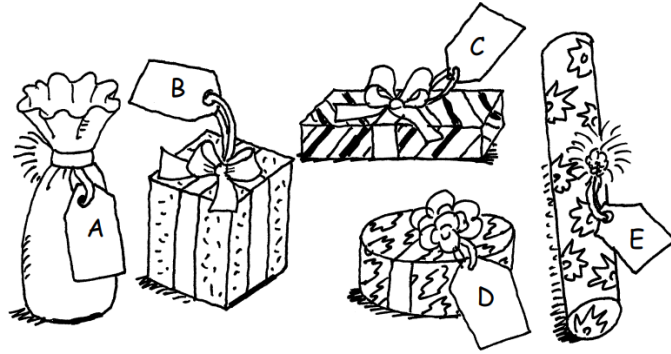
(ii) What is the smallest 4-digit code Stella could make?

Answer: …………..……………… **(1)** Q17

(Total 4 marks)
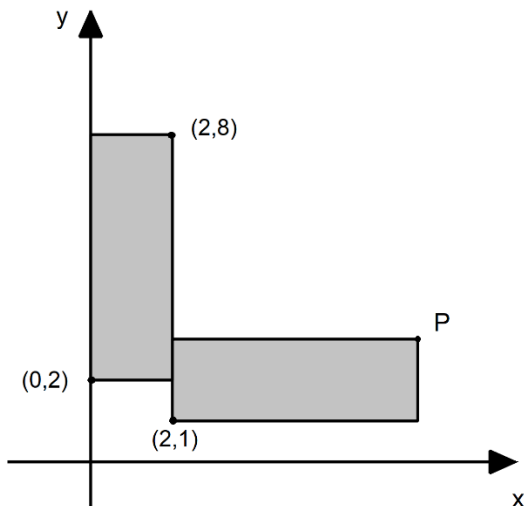
18. Andreas paid €21 for five presents.

For A and B he paid a total of €6.
For B and C he paid a total of €10.
For C and D he paid a total of €7.
For D and E he paid a total of €9.
How much did Andreas pay for each present?

Answer: A = ………. , B = ………. , C = ………. , D = ………. , E = ………. **(3)** Q18

(Total 3 marks)

19. These two rectangles are identical. The length of each rectangle is three times its width.
What are the coordinates of point P?

(*The diagram is not drawn to scale*)

Answer: P (……, ……) **(2)** Q19

(Total 2 marks)

20. (a) If $\frac{3}{7}$ of a number is 18, what is $\frac{5}{6}$ of the same number?

Answer: …………..………………… **(2)**

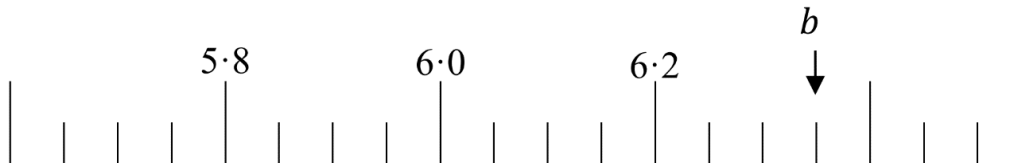(b) Given that $a = \frac{3}{5}$ of b circle all the equations below that are correct.

$5a = 3b$ $\qquad$ $\frac{a}{b} = \frac{3}{5}$ $\qquad$ $3a = 5b$ $\qquad$ $a = \frac{3}{5}b$ $\qquad$ $b = \frac{5}{3}a$

(2) **Q20**
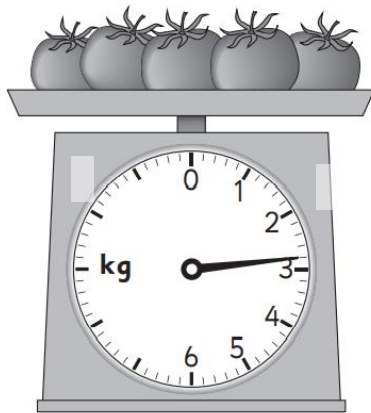
(Total 4 marks)

21. (a) Find the number b indicated by the arrow on the scale below.

Answer: $b =$ …………..………………… **(1)**

(b) Katerina needs 5.5kg of tomatoes.
She puts some tomatoes on the scale as shown.
How many more kg of tomatoes does she need?

Answer: …………..………………… kg **(2)** **Q21**

(Total 3 marks)

11

22. Elena and Paul have created a mathematical rule, $[x]$, where the answer is the largest whole number that is less than x.

For example, $[3.17] = 3$

$[90] = 89$

$[-2.3] = -3$

(a) Calculate

(i) $2.5 - [1.5]$

Answer: …………..………………… **(1)**

(ii) $[5.4] + [3.7]$

Answer: …………..………………… **(1)**

(iii) $\left[3.4 \times [1.23]\right]$

Answer: …………..………………… **(1)**

(b) Elena thinks that the answer to $\left[[2.86] \times [0.25]\right]$ is 0.
Paul thinks the answer is -1. Who is the correct one?

Answer: …………..………………… **(1)** **Q22**

(Total 4 marks)

12

23. Below is part of the Pythagorean table (on the left).
A piece of the painting is shown on the right. Write which number X represents?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32					37	38	39	

X

95

Answer: …………..……………… **(2)** Q23

(Total 2 marks)

24. (a) Express 42 minutes as a fraction of one hour, giving your answer in its simplest form.

Answer: …………..……………… **(1)**

(b) John's father is a truck driver and he had to drive 2380 kilometres in five days.
The first 3 days he was driving for 6 hours per day
with speed 70 kilometres per hour. The fourth day he drove
for 8 hours with speed 80 kilometres per hour.
How many hours did he have to drive on the fifth day,
with speed 80 kilometres per hour to reach his destination?

Answer: …………..……………… hours **(4)** Q24

(Total 5 marks)

13

25. Linear sequences always increase or decrease by the same amount.
For example

5, 7, 9, 11, …   increases by 2 each time
15.7, 15.5, 15.3, 15.1 …   decreases by 0.2 each time

Choose four numbers from the list to make an increasing linear sequence.

3.2   3.5   3.6   3.8   3.9   4.2   4.3   4.5

Answer: ……… , ……… , ……… , ……… **(2)**

(Total 2 marks)

26. A barrel contains 2 litres of water. There are 5 holes in the bottom of the barrel, and each hole loses 50 ml of water each hour.

(a) How many hours will it take for the barrel to completely empty?

Answer: ……….……………… hours **(3)**

(b) Christos manages to stop one of the holes in the bottom of the barrel, so no water is lost from it. How much longer will it take for the barrel to completely empty from full?
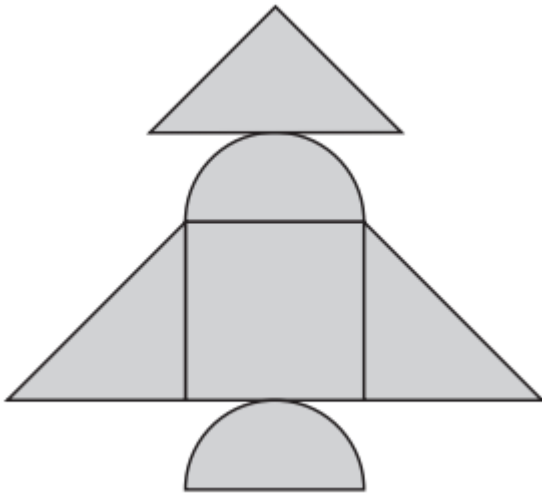
Answer: ……….……………… hours **(2)**

(Total 5 marks)

27. (a) Constantina has some paper circles and some paper squares which she uses to make
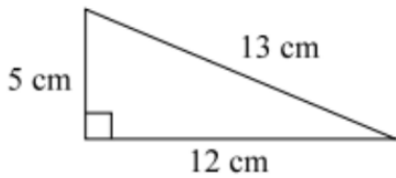a rocket.
The squares have sides of 4 cm and the circles have areas of 10 cm^2.
She cuts some of the shapes in half. What is the area of her rocket?

(*The diagram is not drawn to scale*)

Answer: ……….……………… cm^2 **(3)**

(b) Four copies of the triangle shown are joined together, without gaps or overlaps,
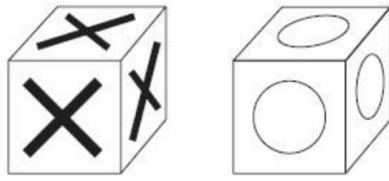to make a parallelogram. What is the largest possible perimeter of the parallelogram?

5 cm
13 cm
12 cm

(*The diagram is not drawn to scale*)

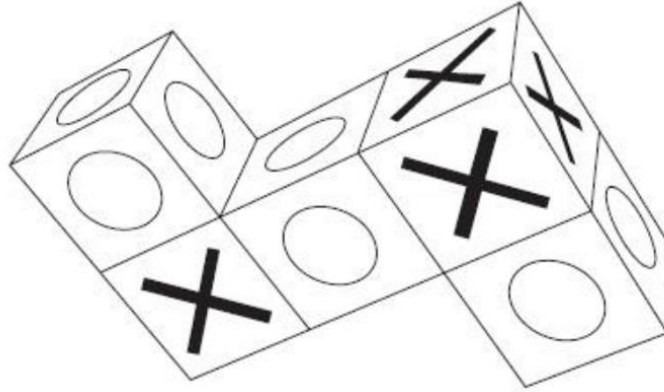Answer: ……….……………… cm **(2)**   **Q27**

(Total 5 marks)

28. Charis has some cubes with X on each face and some cubes O on each face.

He sticks five cubes together to make this shape.

How many X and how many O are on the outside of the shape?
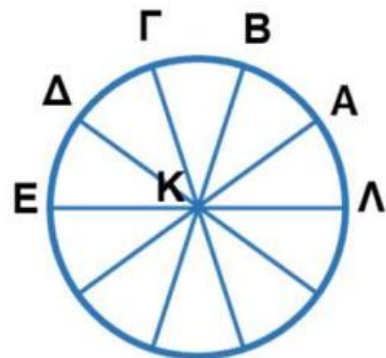
Answer: X ………………………………

O ……………………………… **(2)**

(Total 2 marks)

29. A circle centered at K was divided into ten equal parts, as in the image.
Write the three letters that form an angle of 108°?

Answer: ………….…………………… **(2)**

(Total 2 marks)

30. The **Blast** of a two digit number is obtained as follows:

The **Blast** of 63 is 216 because 6 x 6 x 6 = 216

The **Blast** of 27 is 128 because 2 x 2 x 2 x 2 x 2 x 2 x 2 = 128

(a) Write down the **Blast** of 34.

Answer: …………..………………… **(1)**

(b) Which two digit number has a **Blast** of 125.

Answer: …………..………………… **(1)**

(c) Work out another two digit number which has the same **Blast** as 24.

Answer: …………..………………… **(1)**

(d) The rule **Blast** is applied to a two digit number and also to the answer.
If the final result is 9, what was the original number?

Answer: …………..………………… **(2)** Q30

(Total 5 marks)

TOTAL: 100 MARKS

END

17