



ENTRANCE EXAMINATION 2022

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. (a) Round 14575 to the nearest 100

Answer: (1)

(b) Fill in the missing numbers in the boxes

(i)

$$4 \times \square - 3 = 65$$

(1)

(ii)

$$8 \times 80 \times 100 = 8^2 \times \square$$

(1)

(c) Which symbol goes in the box > , < or =

$$0.15 \times 1000 \square 800 \div 5$$

(1) Q1

(Total 4 marks)

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2. Tick the fractions that are equal to 20%.

$$\frac{1}{20} \quad \square$$

$$\frac{20}{40} \quad \square$$

$$\frac{1}{5} \quad \square$$

$$\frac{3}{15} \quad \square$$

$$\frac{2}{100} \quad \square$$

(2) Q2

(Total 2 marks)

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Leave blank

3. At a birthday party one-half drank only lemonade, one-third drank only cola, fifteen people drank neither, and nobody drank both.



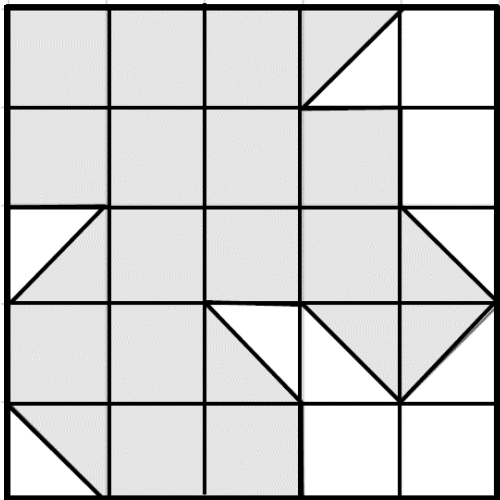
How many people were at the party?

Answer: people (2) Q3

(Total 2 marks)

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4. What percentage of the large square is shaded?



Answer: % (2) Q4

(Total 2 marks)

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5. (a) Write the three prime numbers which multiply to make 255

$$\square \times \square \times \square = 255$$

(1)

(b) I think of a number n .

$5n$ is more than 60
 $n+5$ is less than 20



What are the possible values of n ?

Answer: (2)

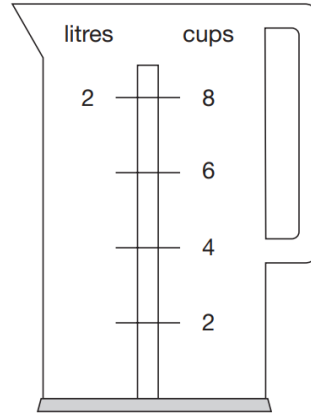
(c) Find the smallest number which leaves 3 as remainder when divided by 8, 12 and 16.

Answer: (2) Q5

(Total 5 marks)

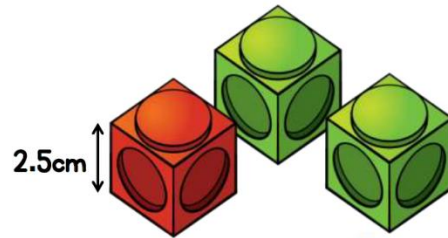
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6. (a) Eleni's kettle holds 2 litres of water.
How many millilitres are equal to 1 cup?



Answer: ml (2)

(b) A tower is made of identical red and green cubes.
For every 1 red cube there are 2 green cubes.
Each cube has a height of 2.5 cm.
The tower is 30 cm tall.
How many green cubes are in the tower?



Answer: (3) Q6

(Total 5 marks)

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7. The mean age, in years, of Ahmed, George and Chloe is 21.
The mean age, in years, of Ahmed and George is 19.
Work out Chloe's age.

Answer: (3) Q7

(Total 3 marks)

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8. (a) Work out $3\frac{2}{5} - 1\frac{1}{2}$

Answer: (2)

(b) Complete the boxes below so that the fractions and mix number are equivalent.

$$\frac{12}{\boxed{}} = \frac{18}{12} = \boxed{} \frac{\boxed{}}{18}$$

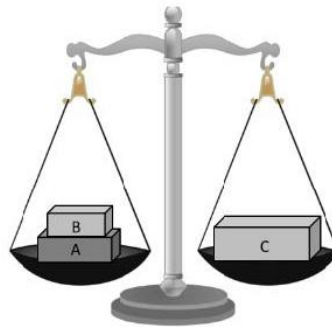
(2) Q8

(Total 4 marks)

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9. Tara has three parcels.

Parcels **A** and **B** together weigh the same as parcel **C**.
 The three parcels weigh 900 grams altogether.
 Parcel **A** weighs 350 g.
 How much does parcel **B** weigh?



Answer: g (3) Q9

(Total 3 marks)

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10. (a) Find the missing number n in the following sequence

96, n , 24, 12, 6

Answer: $n = \dots\dots\dots$ (1)

(b) A sequence of numbers is

2, 4, 6, 8, 2, 4, 6, 8, 2, 4,

(i) What is the 16th number in the pattern?

Answer:

(ii) What is the 105th number in the pattern? (You are not expected to write them all out.)

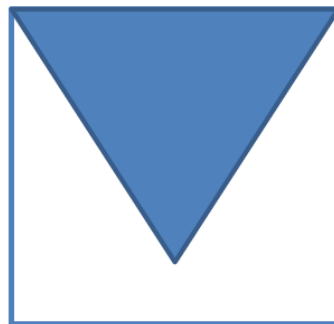
Answer:

(Total 4 marks)

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11. Here is a square.

Inside the square is an equilateral triangle.
The perimeter of the triangle is 54 cm.
Find the perimeter of the square.



(The diagram is not drawn to scale)

Answer: cm (2) Q11

(Total 2 marks)

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12. Vegetables are being sold at the Mathmarket.

- (a) Alexander buys 17 carrots and 6 turnips.
Carrots cost 8 cents each and turnips cost 13 cents each.

How much did Alexander spend in total, give your answer in euros (€)?

Answer: € (3)

- (b) Sophia buys 16 red peppers and receives €8.32 change from €20.
What is the price of a pepper? Give your answer in cents.

Answer: Each pepper costs cents (3)

- (c) Sonia sells vegetables at the market. On Monday she sold half of her vegetables.
On Tuesday she sold a third of the vegetables she had left.
What fraction of her original stock does she have left to sell on Wednesday?

Answer: Sonia has of her vegetables remaining (2) Q12

(Total 8 marks)

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13. Here is a table of temperatures at dawn on the same day in different cities.

Temperatures °C	
London	-4°
Moscow	-6°
New York	-9°
Paris	+6°
Sydney	+14°



(a) Which city had the lowest temperature?

Answer: (1)

(b) What is the difference in temperature between London and Paris?

Answer: °C (1)

(c) At noon the temperature in New York has risen by 5°C.
What is the temperature in New York at noon?

Answer: °C (2) Q13

(Total 4 marks)

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14. The time on the clock is 09:37 .
When the minute hand is turned clockwise by 240° ,
what will be the time on the clock?



Answer: (2) Q14

(Total 2 marks)

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15. Last year my age was a square number. Next year it will be a cube number.
(a) How old am I now?

Answer: (1)

(b) After how many years will my age be both a square number and a cube?

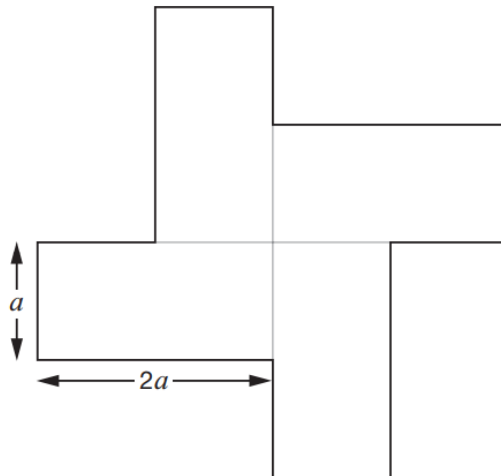


Answer: (2) Q15

(Total 3 marks)

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16. This shape is made of four congruent rectangles.
All measurements are given in cm.
Each rectangle has length $2a$ and width a



(The diagram is not drawn to scale)

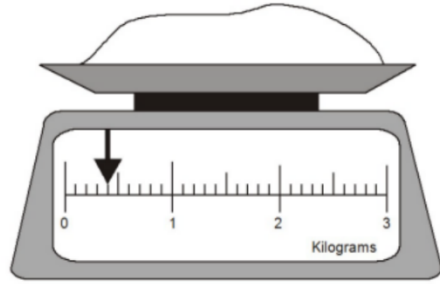
The perimeter of the shape is 80 cm. Work out the area of the shape.

Answer: cm^2 (3) Q16

(Total 3 marks)

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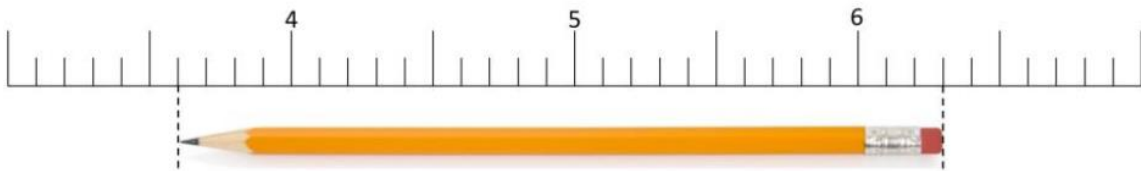
17. (a) Here is some flour on a weighing scale.



How many grams of flour are on the weighing scale?

Answer: g (1)

(b) How long is the pencil?

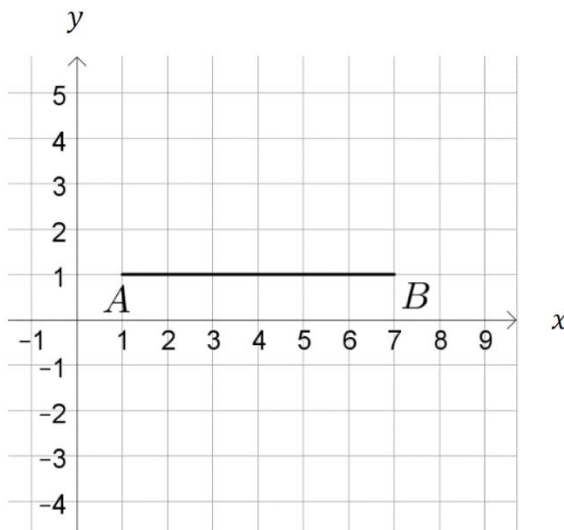


Answer: (2) Q17

(Total 3 marks)

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18. ABC is an isosceles triangle with an area of 12 cm^2 . Assume each square is 1 cm in length. Find two possible positions for the vertex C and write down their coordinates.



Answer: C (.....,))

C (.....,) (3) Q18

(Total 3 marks)

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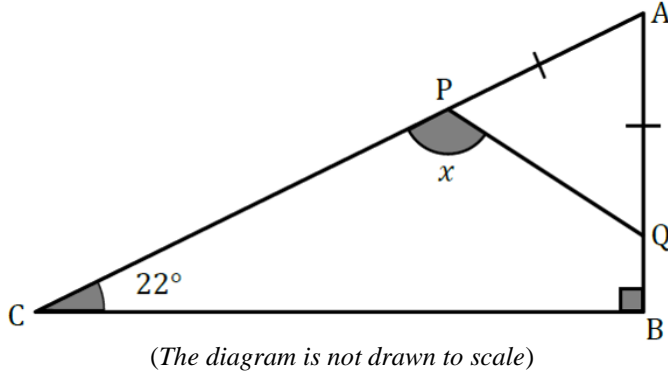
19. ABC is a right-angled triangle.

P is a point on AC and Q is a point on AB

APQ is an isosceles triangle, with $AP = AQ$ as shown.

Angle C is 22° .

Find the angle x .

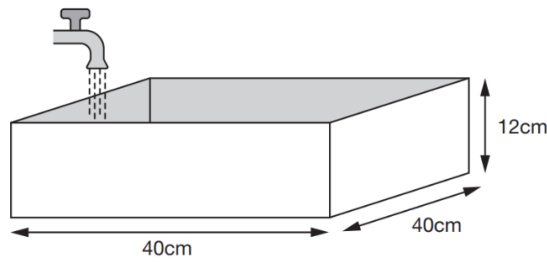


Answer: $x = \dots\dots\dots^\circ$ (3) Q19

(Total 3 marks)

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20. Every second, 300 cm^3 of water comes out of a tap into the cuboid tank below.



The base of the tank has length and width 40 cm. The height is 12 cm.
How many seconds does it take to fill the tank if it is initially empty?

Answer: $\dots\dots\dots$ seconds (3) Q20

(Total 3 marks)

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21.

$$10\% \text{ of } \boxed{R} = 7$$

$$\frac{1}{5} \text{ of } \boxed{Q} = \boxed{R}$$

$$25\% \text{ of } \boxed{P} = \boxed{Q}$$

Calculate $\boxed{P} + \boxed{R}$

Answer: (3) Q21

(Total 3 marks)

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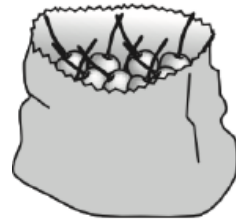
22. Sarah had a bag of cherries.

She ate 5 cherries, then gave half of what she had left to Liam.

Liam ate 5 of his cherries, then gave half of what he had left to Amy.

Amy got 2 cherries.

How many cherries did Sarah have in her bag at the start?





Answer: cherries (2) Q22

(Total 2 marks)


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23. ☺ means square the first number and then add on the first number multiplied by the second number.


For example $4 \text{ ☺ } 3 = 4^2 + 4 \times 3 = 4 \times 4 + 4 \times 3 = 16 + 12 = 28$

Work out values for ,  and 


(a) $2 \text{ ☺ } 5 = \text{diamond}$

Answer:  = (1)

(b) $5 \text{ ☺ } \text{square} = 45$

Answer:  = (1)

(c) $\text{star} \text{ ☺ } \text{star} = 18$

Answer:  = (2) Q23

(Total 4 marks)

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24. Two trains leave from different stations, 304 km apart, at the same time and travel toward each other.

One train travels at 105 km per hour, while the other travels at 85 km per hour. How long will it take for the two trains to meet? Give your answer in minutes.



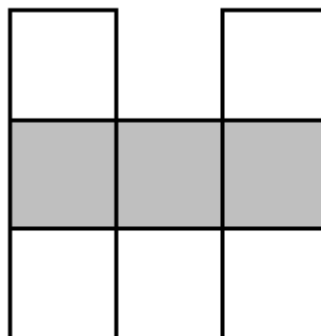
Answer: minutes (3) Q24

(Total 3 marks)

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25. In the figure below, the whole numbers from 1 through 7 are to be placed, one per square. The sum of the numbers in the left column, the sum of the numbers in the right column, and the sum of the numbers in each diagonal are the same.

Complete the boxes below and find the least possible product of the numbers across the grey row?



Answer: (3) Q25

(Total 3 marks)

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26. The points A, B, C and D lie in order on a straight line.

$$AB : BD = 1 : 5$$
$$AC : CD = 7 : 11$$

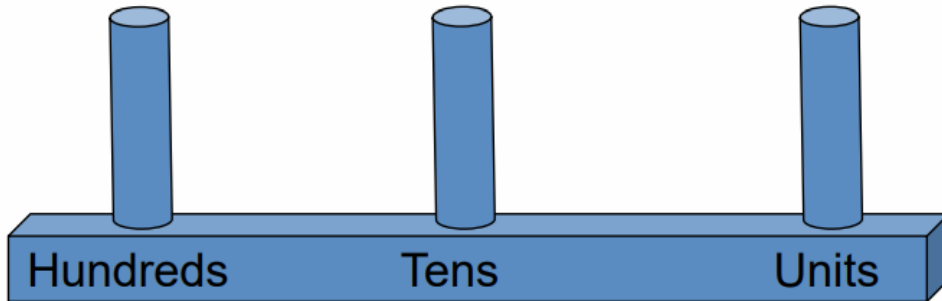
Find the ratio $AB : BC : CD$

Answer: $AB : BC : CD = \dots : \dots : \dots$ (2) Q26

(Total 2 marks)

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27. Imagine you have 25 beads. You have to make a three-digit number on an abacus. You must use all 25 beads for each number you make.



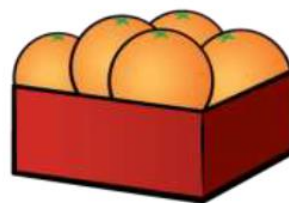
Find all the different three-digit numbers that you can make and write them in **ascending order**.

Answer: (3) Q27

(Total 3 marks)

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28. A shop owner bought oranges in boxes of 5.
She bought 8 boxes of oranges.
The cost of each box was €2.40
The owner sold the oranges separately.
By the end of the week, she sold $\frac{9}{10}$ of the oranges.



Find how much she sold each orange to make a profit of €6.

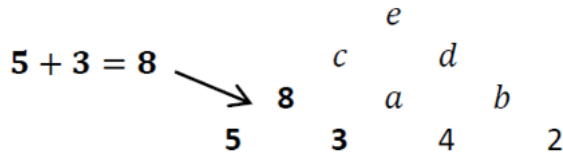
Answer: € (4) Q28

(Total 4 marks)

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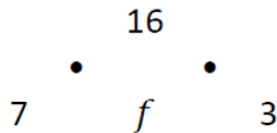
29. The diagram below shows a number pyramid.
 By adding the numbers in any row together in pairs you can find the numbers in the row above.
 For example, on the bottom row $5 + 3 = 8$ on the row above.

(a) Complete the pyramid to find the values of a , b , c , d and e .



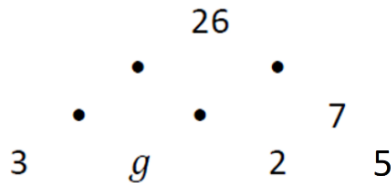
Answer: $a = \dots\dots\dots$, $b = \dots\dots\dots$, $c = \dots\dots\dots$, $d = \dots\dots\dots$, $e = \dots\dots\dots$ (2)

(b) Here is a different number pyramid with the same rule. Find the value of f .



Answer: $f = \dots\dots\dots$ (1)

(c) Here is a different number pyramid with the same rule. Find the value of g .

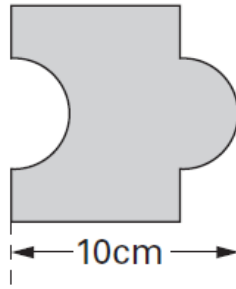


Answer: $g = \dots\dots\dots$ (2) Q29

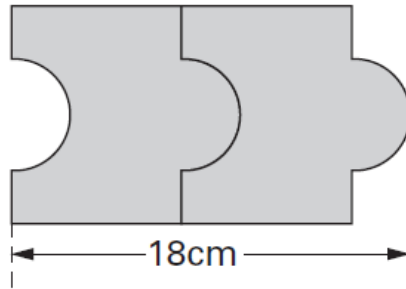
(Total 5 marks)

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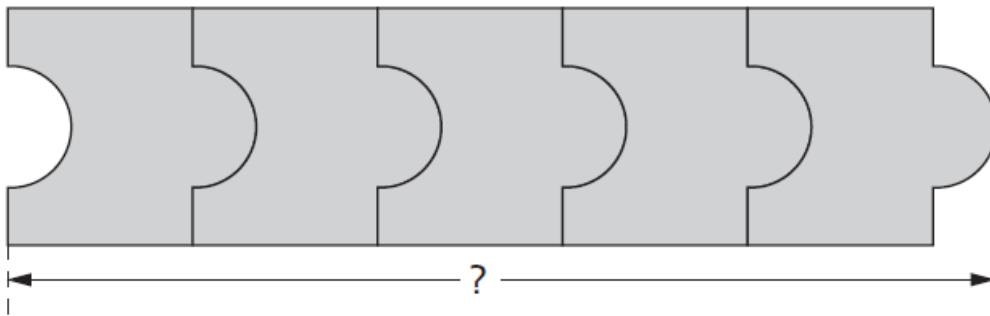
30. Josh has some tiles.
Each tile is 10 cm long.



Two tiles fitted together are 18 cm long.



(a) Calculate the length of five tiles fitted together.



Answer: cm (1)

(b) The length of n tiles fitted together is 90 cm. Find n .

Answer: $n =$ (2) Q30

(Total 3 marks)

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TOTAL: 100 MARKS

END