ONLINE ROUND

MATHEMATICS CHALLENGE

AGE CATEGORY: LITTLE BEE (9-11 YEARS OLD)

YOUNG MASTER CHALLENGE

Maths Topics for Little Bee: 9-11 Years Old

Mathematics knowledge test will assess the following topics:

Number and place value: Understanding the place value of digits up to thousands, using negative numbers in context, rounding, and estimating calculations.

Addition, subtraction, multiplication and division: Understanding the concepts of these operations, including multiplying and dividing numbers up to 6 digits by a single digit and using formal methods for written calculations.

Fractions: Understanding fractions as numbers, including equivalent fractions, adding and subtracting fractions, and multiplying fractions by whole numbers.

Decimals: Understanding decimals as numbers, including converting between decimals, fractions and percentages, and understanding decimal place value.

Ratio and proportion: Understanding the concepts of ratio and proportion, including solving problems involving ratio and proportion.

Algebra: Understanding and using simple formulae and algebraic notation, including patterns and relationships, substitution and solving simple equations, and solving problems using algebraic reasoning.

Measurement: Understanding and using standard units of measurement for length, mass, volume, temperature, time, area and volume, including converting between units and using compound units.

Geometry: Understanding and using properties of shapes, including symmetry, congruence, and similarity, and understanding and using properties of 2D and 3D shapes, lines and angles.

Statistics: Understanding and interpreting data, including creating and interpreting different types of graphs and charts, and using mean, mode and median to describe a set of data, and understanding and using concepts of probability.

Problem-solving: Using mathematical concepts and skills to solve problems in a variety of contexts.

1. What is the value of $1\frac{2}{5} + \frac{1}{10}$?

   A. $2\frac{1}{10}$

   B. $2\frac{3}{10}$

   C. $1\frac{1}{2}$

   D. $2\frac{9}{10}$

2. Today is Friday. What day will it be in 40 days' time?

   A. Monday
   B. Tuesday
   C. Wednesday
   D. Thursday

3. Half of a half of a number is equal to $\frac{1}{2}$.

   What is half of the number?

   A. $\frac{1}{2}$

   B. $\frac{1}{4}$

   C. $\frac{1}{8}$

   D. 1

4. $2701 \times 0.3 = 810.3$. What is the value of 270100×0.003?

A. 81030
B. 8103
C. 810.3
D. 81.03

5. The price of a jacket is reduced by 10% to £45.

What is the ratio of the reduced price of the jacket to its original price?

A. 9:10
B. 10:9
C. 7:9
D. 9:7

6. What is the value of $(2 - 5)^2 \times 2 - 18$?

A. -18
B. -1
C. 1
D. 0

7.   Tariq thinks of a mumber.

He doubles it, adds 9, divides his answer by 3 and finally subtracts 1.

He obtains the number 4.

What was the number Tariq was thinking of?

    A. 9
    B. 6
    C. 4
    D. 3

8.   Five students completed a maths test out of a total of 25 marks and their scores were as follows:

Mark got 19, Sarah got 18, Max got 20 and Zeynep got 14.

The fifth student, Ali scored x marks. The average mark of the five students was 17.

Which two students have the same score?

    A. Mark and Ali
    B. Zeynep and Ali
    C. Max and Ali
    D. Sarah and Ali

9.   In the triangle, angles x is three times bigger than angle y.

Angle z is 40°.

What is the size of angle y?

not to scale
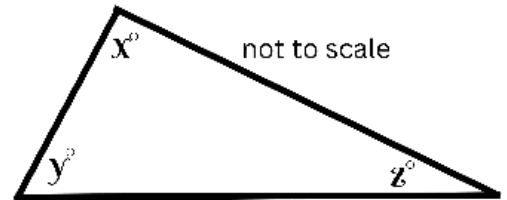
   A. 30°
   B. 32°
   C. 35°
   D. 105°

10.   Esma is 99 years old. In Esma's lifetime, how many times was her age in years a prime number?

   A. 2
   B. 5
   C. 15
   D. 25

11.	There are 10 cars in a car park. Three-fifths of the cars are grey.

There are half as many black cars as grey cars.

The rest of the cars are white.

What is the ratio of white cars to black cars?

A. 5:1

B. 3:5

C. 1:3

D. 3:1

12.	The number of petals in flowers come in a form of a number sequence known as Fibonacci sequence.

The first 6 terms of the sequence are 2, 3, 5, 8, 13,….

What is the next term of this sequence?

A. 15

B. 17

C. 19

D. 21

13.   Alfie solves the following equation to find the value of x.

$$2(x - 5) = 3x - 21$$

He then adds this number to his age and he gets 21.

How old is Alfie?

   A. 9

   B. 10

   C. 11

   D. 13

14.   Andy estimates the distance from his home to the nearest town to be 10 kilometres. The distance from his home to a local shop is 100 metres. The shop is on the same road.

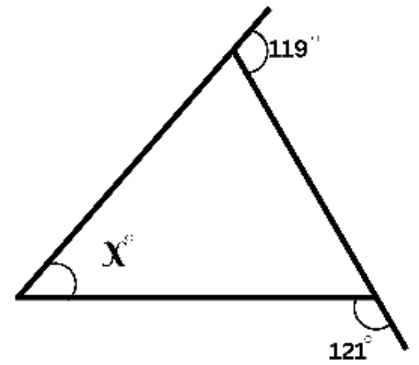How many millimetres is the town further from the shop?

   A. 10,000,000

   B. 9,900,000

   C. 900,000

   D. 90,000
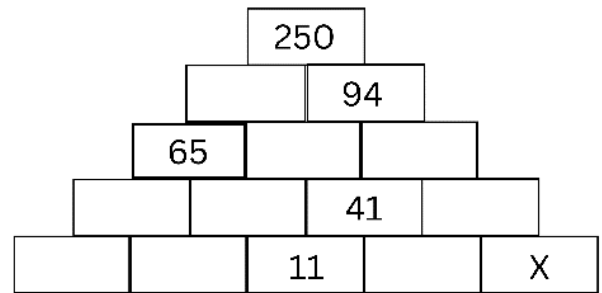
15.   Which of the following statements is false?

    A. 42 is a multiple of 2

    B. 423 is a multiple of 3

    C. 4234 is a multiple of 4

    D. 42 345 is a multiple of 5

16.   What is the value of x in this triangle?

    A. 60°
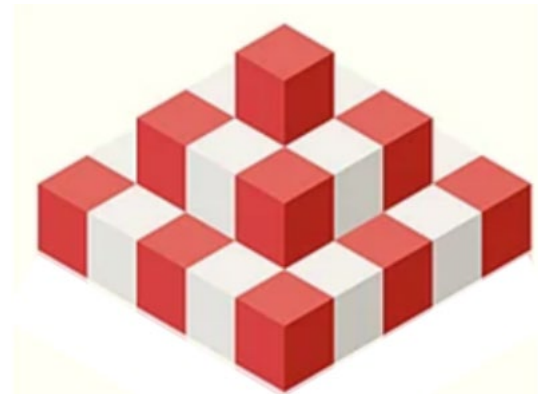   B. 55°
    C. 50°
    D. 45°

17.   In this partly completed pyramid, each rectangle is to be filled with the sum of the two numbers in the rectangles immediately below it.
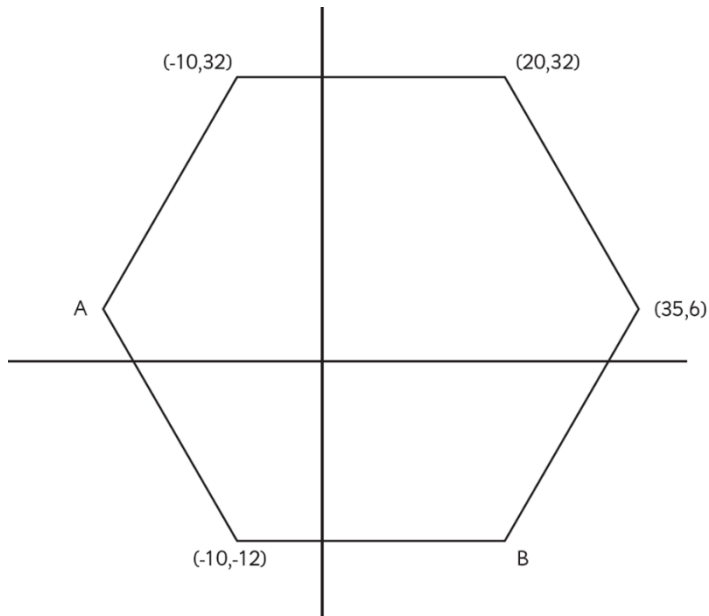
What number should replace x?

A. 68

B. -43

C. -68

D. 43

18.   The diagram shows a pyramid made up of 35 cubes, each measuring 1mx1mx1m.

What is the total surface area of the whole pyramid (including its base)?

A. $35m^2$
B. $61m^2$
C. $71m^2$
D. $86m^2$

19.   A regular hexagon is drawn on this coordinates grid.

Which given coordinates are correct for corners A and B?

A. A = (-35 , 6)
B. B = (20 , -32)
C. A = (-25 , 6)
D. B = (10 , -12)

20.

James leaves for school at 8.25am and returns at 3.35pm.
His walk to and from school takes 20 minutes each way.

How long does he spend at school each day?

A. 6 hours 50 minutes
B. 6.5 hours
C. 5 hours 40 minutes
D. 5.5 hours

21.   A plumber charges £16 for each job that he attends, and then £9 per hour for every hour that he works.

What is the formula that could be used to calculate how much the plumber would charge for a job, where h stands for the number of hours worked?

        A. $9h - 16$
        B. $16h + 9$
        C. $9h + 16$
        D. $16h - 9$

22.   The line graph below is showing the temperature inside and outside during a school day:

The temperature inside and outside during a school day
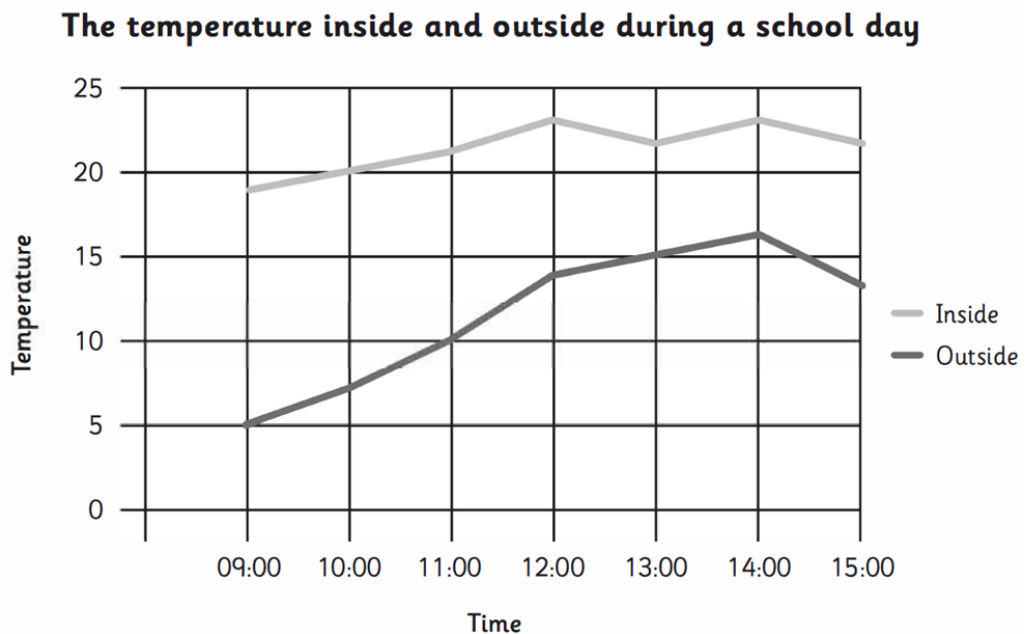
At what time was the largest difference between the inside and outside temperature?
        A. 09:00
        B. 11:00
        C. 13:00
        D. 15:00

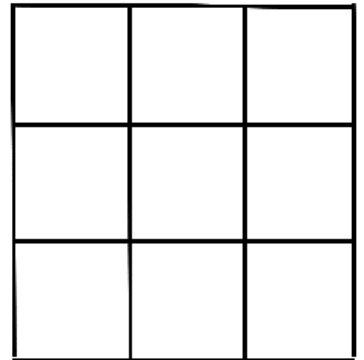23.   A square is folded exactly in half and then in half again.

Which one below could not be the resulting shape?

    A. Square

    B. Triangle

    C. Rectangle

    D. Rhombus

24.   This 3 by 3 grid shows nine $1\ cm$ x $1\ cm$ squares and uses 24 cm of wire.

What length of wire is required for a similar 10 by 10 grid?

    A. 240 cm

    B. 210 cm

    C. 220 cm

    D. 200 cm

25.   James leaves for school at 8.25am and returns at 3.35pm. His walk to and from school takes 20 minutes each way. How long does he spend at school each day?

    A. 6 hours 50 minutes
    B. 6.5 hours
    C. 5 hours 40 minutes
    D. 5.5 hours