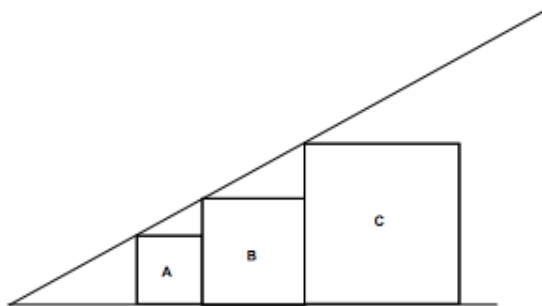


## Round 2

- 1 The area of a rectangle is 900 square meters. The width of the rectangle is increased by 20% and the length of the rectangle is decreased by 20%. Find the area of the new rectangle in square meters.

a 576                      b 864                      c 900                      d 937.5

- 2 Squares A, B and C are arranged as shown in the picture below. The top left vertex of each square lies on the same line. If the area of Square A is 16 and the area of Square B is 36, find the area of Square C.



a 64                      b 72                      c 81                      d 100

- 3 At a certain bakery, a baguette costs 1.50 euros and a sweet roll costs 1.00. The bakery increases the cost of a baguette by 10% and the cost of a sweet roll by 5%. If a customer usually buys 2 baguettes and 2 sweet rolls, what is the total increase on this purchase rounded to the nearest percent?

a 7%                      b 8%                      c 15%                      d 30%

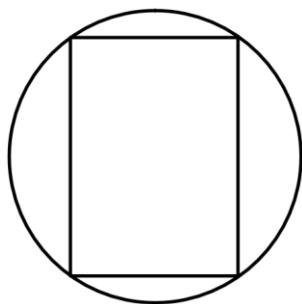
- 4 A square of side length 1 cm is drawn. A larger square is drawn around it such that all parallel sides are a distance 1 cm apart. This process continues until the total perimeter of the squares drawn is 144 cm. What is the area of the largest square drawn?

a  $121 \text{ cm}^2$                       b  $120 \text{ cm}^2$                       c  $100 \text{ cm}^2$                       d  $81 \text{ cm}^2$

- 5 A book has 500 pages numbered 1,2,3,... and so on how many times does the digit 1 appear in its page numbers?

a 180                      b 194                      c 199                      d 200

- 6 The circle in the diagram has a radius of 6 cm. If the perimeter of the rectangle is 28 cm, what is the area of the rectangle?



*Diagram not to scale*

- a       $24 \text{ cm}^2$                   b       $26 \text{ cm}^2$                   c       $33 \text{ cm}^2$                   d       $40 \text{ cm}^2$
- 7 How many different sums can be obtained by adding any two different integers chosen from these 35 consecutive integers?  
 $-17, -16, -15, -14, \dots, -1, 0, 1, \dots, 14, 15, 16, 17$
- a      17                          b      34                          c      66                          d      67
- 8 How many whole numbers lie in the interval between  $\frac{7}{3}$  and  $3\pi$ ?
- a      4                          b      5                          c      6                          d      7
- 9 Sarah and Josh each start saving today. Sarah saves 30 cents every day. Josh saves 1 cent on the first day, then 2 cents on the second day, 3 cents on the third day, and so on, saving one cent more each day than on the day before. At the end of how many days will they have saved the same total amounts?
- a      59                          b      58                          c      35                          d      30
- 10 Consider the result of inserting two multiplication symbols between the digits 2, 2, 3, 3 and 3, in that order.  
For example,  $2 \times 233 \times 3 = 1398$   
What is the largest number that can be made in this way?
- a      1518                          b      2007                          c      2178                          d      2022

11 What is the units' digit of  $3^{2022}$ ?

- a 1                      b 3                      c 7                      d 9

12 What is the remainder when

$$1 \times 2 \times 3 \times 4 + 2 \times 3 \times 4 \times 5 + 3 \times 4 \times 5 \times 6 + 4 \times 5 \times 6 \times 7 + 5 \times 6 \times 7 \times 8 + 6 \times 7 \times 8 \times 9$$

is divided by 7?

- a 0                      b 1                      c 3                      d 6

13 In a sale, the price of a calculator is reduced by 20%. At this reduced price the shopkeeper still makes a profit of 20%. What would have been her percentage profit if the calculator had been sold at full price?

- a 55%                      b 50%                      c 40%                      d 30%

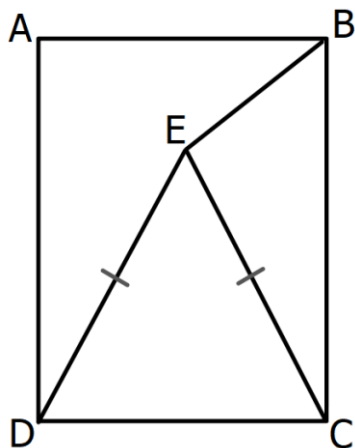
14  $160 = 30 + 31 + 32 + 33 + 34$

How many numbers between 100 and 1000 cannot be written as the sum of two or more consecutive positive integers?

- a 120                      b 52                      c 3                      d 2

15 In the diagram, ABCD is a rectangle and  $DE = CE$ .

If the area of triangle BEC is  $12 \text{ cm}^2$ , what is the area of ABCD? *Diagram not to scale.*



- |   |                   |   |                   |
|---|-------------------|---|-------------------|
| a | $36 \text{ cm}^2$ | b | $42 \text{ cm}^2$ |
| c | $48 \text{ cm}^2$ | d | None of the above |

- 16 If  $5^{21} \times 2^{18}$  is multiplied out what is the leading digit of the product?

*Note: The leading digit is the digit in the leftmost position*

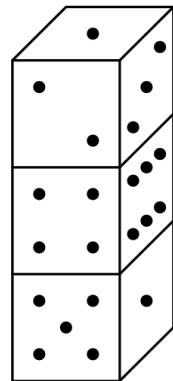
a 5                      b 4                      c 2                      d 1

- 17 A goat is tied to the corner of a square shed measuring 6m on each side. The rope is 8m long. The area outside the shed over which the goat can wander is  $N\pi$  square meters. Find the whole number N.

a 100                      b 64                      c 50                      d 48

- 18 Three dice with faces numbered 1 through 6 are stacked as shown. Seven of the eighteen faces are visible, leaving eleven faces hidden (back, bottom, between). The total number of dots NOT visible in this view is

a 53                      b 41  
c 31                      d 22



- 19 Two young people Adrian and Susan were once the same height. Since then Susan has grown 20% while Adrian has grown half as many centimeters as Susan. Susan is now 180 cm tall. How tall, in centimeters, is Adrian now?

a 144                      b 156                      c 162                      d 165

- 20 The integer 64 has the property that it is divisible by its unit digit. How many integers between 10 and 50 have this property?

a 15                      b 16                      c 17                      d 20