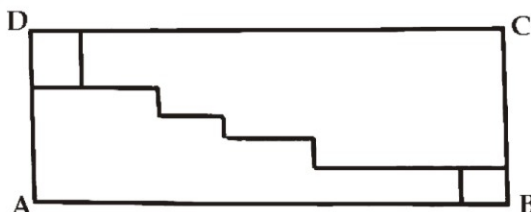


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SECTION ONE - (3 points)

1. The rectangle $ABCD$ with perimeter 4 m is divided into 4 parts by 4 horizontal and 5 vertical segments. If the sum of the lengths of the vertical segments is equal to 44 cm , find the sum of the lengths of the horizontal ones.



- (A) 88 cm (B) 102 cm (C) 124 cm
(D) 156 cm (E) 180 cm
2. When the letters of the word MAMA are written vertically above one another, the word has a vertical line of symmetry.

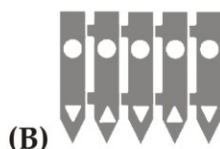
M
A
M
A

Which of these words also have a vertical line of symmetry when written in the same way?

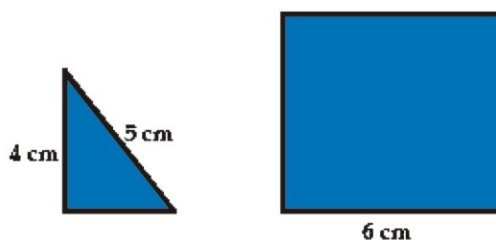
- (A) ROOT (B) BOOM (C) BOOT
(D) LOOT (E) TOOT
3. Koko the kangaroo is preparing for the Olympics. In the first training series, he jumped 225 jumps in a row. Because he was tired, he jumped 196 in the second and 169 in the third series. In fourth he jumped 144, in fifth 121, and in the sixth 100 jumps. How many times in a row did Koko jump in the last, eighth series?
- (A) 81 (B) 79 (C) 64
(D) 58 (E) 49
4. A tank of water was $\frac{1}{2}$ full. Then 200 liters were used for watering the flowers. Now the tank is $\frac{1}{3}$ full. What is the full capacity of the tank?

- (A) 1000 liters (B) 1200 liters (C) 1400 liters
(D) 1600 liters (E) 1800 liters

5. The panels of Fergus' fence are full of holes. One morning, one of the panels fell flat on the floor. Which of the following could Fergus see as he approached his fence?



6. Two figures of a right-angle triangle and a square are shown below. Which of the following statements is true?



- (A) Area of the triangle is 6 cm^2 more than the area of the square
 (B) Perimeter of the triangle is 12 cm less than the perimeter of the square
 (C) Area of the triangle is 10 cm^2 less than the perimeter of the square
 (D) Perimeter of the triangle is equal to the area of the square
 (E) Area of the triangle is equal to the perimeter of the square
7. Kate said once: "Exactly a month ago was the same day of the week as two days ago". What is a month when this could happen?

- (A) January
 (D) April

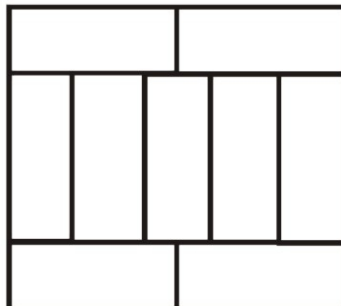
- (B) February
 (E) May

- (C) March

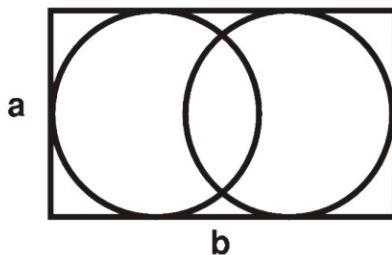
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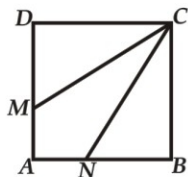
8. A large rectangle is made up of nine identical rectangles whose longest sides are 10 cm long. What is the perimeter of the large rectangle?



- (A) 40 cm (B) 48 cm (C) 76 cm
 (D) 81 cm (E) 90 cm
9. Inside a rectangle of dimensions $a \times b$ with $a < b$ there are two circles, each touches three of the sides of the rectangle, as shown. What is the distance between the centers of the two circles?



- (A) $(b - a)\pi$ (B) $\frac{1}{4}(a + b)$ (C) $\frac{1}{8}(b^2 - a^2)$
 (D) $b - a$ (E) none of the previous
10. Square $ABCD$ has sides of length 3 cm. The points M and N lie on AD and AB so that CM and CN split the square into three pieces of the same area. What is the length of DM ?



- (A) 0.5 cm (B) 1 cm (C) 1.5 cm
 (D) 2 cm (E) 2.5 cm

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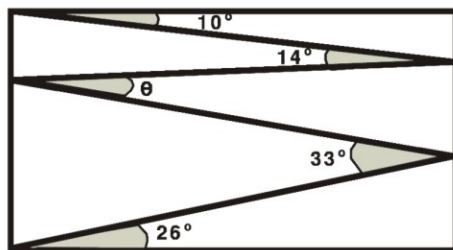
Time Allowed: 180 minutes

SECTION TWO - (4 points)

11. Martha multiplied two 2-digit numbers correctly on a piece of paper. Then she scribbled out three digits as shown. What is the sum of the three digits she scribbled out?

The diagram shows a multiplication problem on a grid. The equation is $3 \times 2 = 32$. The first '3' is scribbled out, the '2' is scribbled out, and the '3' in the product is scribbled out. The remaining visible digits are the '2' in the multiplier, the '2' in the product, and the '2' in the multiplier.

- (A) 5 (B) 6 (C) 9
(D) 12 (E) 14
12. A rectangle is divided into 40 identical squares. The rectangle contains more than one row of squares. Andrew found the middle row of squares and coloured it. How many squares did he not colour?
- (A) 20 (B) 30 (C) 32
(D) 35 (E) 39
13. Philip wants to know the weight of a book within an error margin of half a gram. His weighing scale can only weigh within an error margin of 10 grams. What is the smallest number of identical copies of this book that Philip should weigh together to be able to do what he wants?
- (A) 5 (B) 10 (C) 15
(D) 20 (E) 50
14. A lion is hidden in one of three rooms. A note on the door of room 1 reads "The lion is here". A note on the door of room 2 reads "The lion is not here". A note on the door of room 3 reads " $2 + 3 = 2 \times 3$ ". Only one of these sentences is true. In which room is the lion hidden?
- (A) In room 1. (B) In room 2. (C) In room 3.
(D) It may be in any room. (E) It may be in either room 1 or room 2.
15. Valeriu draws a zig-zag line inside a rectangle, creating angles of 10° , 14° , 33° and 26° as shown. What is the size of angle θ ?



- (A) 11° (B) 12° (C) 16°
(D) 17° (E) 33°

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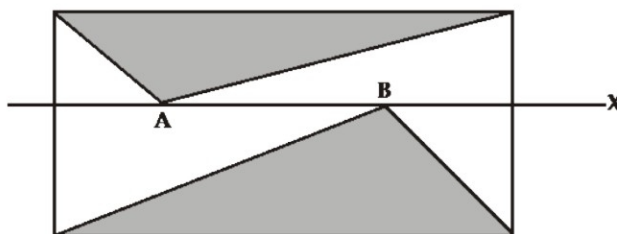
16. Alice wants to write down a list of prime numbers less than 100, using each of the digits 1,2,3,4 and 5 exactly once and no other digits. Which prime number must be in her list?

(A) 2 (B) 5 (C) 31
(D) 41 (E) 53

17. A hotel on an island in the Caribbean advertises using the slogan "350 days of sun every year!". According to the advert, what is the smallest number of days Willi Burn has to stay at the hotel in 2018 to be certain of having two consecutive days of sun?

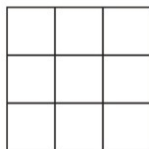
(A) 17 (B) 21 (C) 31
(D) 32 (E) 35

18. The diagram shows a rectangle and a line X parallel to its base. Two points A and B lie on X inside the rectangle. The sum of the areas of the two shaded triangles is 10 cm^2 . What is the area of the rectangle?



(A) 18 cm^2 (B) 20 cm^2 (C) 22 cm^2
(D) 24 cm^2 (E) It depends on the positions of A and B

19. James wrote a different integer from 1 to 9 in each cell of a 3×3 table. He calculated the sum of the integers in each of the rows and in each of the columns of the table. Five of his answers are 12, 13, 15, 16 and 17, in some order. What is his sixth answer?



(A) 17 (B) 16 (C) 15
(D) 14 (E) 13

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20. Eleven points are marked from left to right on a straight line. The sum of all the distances between the first point and the other points is 2018. The sum of all the distances between the second point and the other points, including the first one, is 2000. What is the distance between the first and second points?

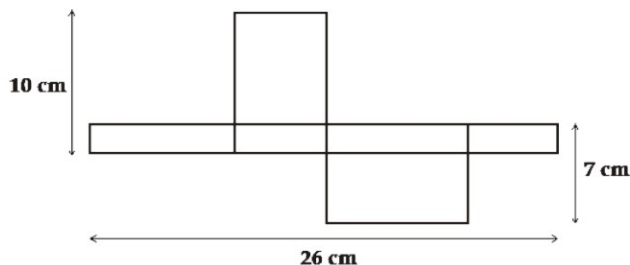
(A) 1 (B) 2 (C) 3
 (D) 4 (E) 5

SECTION THREE - (5 points)

21. There are three candidates for one position as class monitor and 130 students are voting. Suhaimi has 24 votes so far, while Khairul has 29 and Akmal has 37. How many more votes does Akmal need in order to be elected?

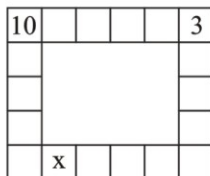
(A) 13 (B) 14 (C) 15
 (D) 16 (E) 17

22. The diagram shows a net of an unfolded rectangular box. What is the volume of the box?



(A) 43 cm^3 (B) 70 cm^3 (C) 80 cm^3
 (D) 100 cm^3 (E) 1820 cm^3

23. Ria wants to write a number in every cell on the border of a 5×6 table. In each cell, the number she writes is equal to the sum of the two numbers in the cells with which this cell shares an edge. Two of the numbers are given in the diagram. What number will she write in the cell marked x ?

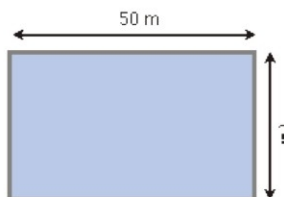


(A) 10 (B) 7 (C) 13
 (D) -13 (E) -3

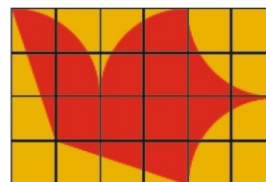
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24. Simon and Ian decide to have a race. Simon runs around the perimeter of the pool shown in the diagram while Ian swims lengths of the pool. Simon runs three times faster than Ian swims. Ian swam six lengths of the pool in the same time Simon ran around the pool five times. How wide is the pool?



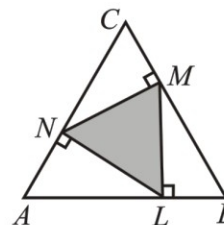
- (A) 25 m (B) 40 m (C) 50 m
 (D) 80 m (E) 180 m
25. Freda's flying club designed a flag of a flying dove on a square grid as shown. The area of the dove is 192 cm^2 . All parts of the perimeter of the dove are either parts of a circle or straight lines. What are the dimensions of the flag?



- (A) $6 \text{ cm} \times 4 \text{ cm}$ (B) $12 \text{ cm} \times 8 \text{ cm}$ (C) $20 \text{ cm} \times 12 \text{ cm}$
 (D) $24 \text{ cm} \times 16 \text{ cm}$ (E) $30 \text{ cm} \times 20 \text{ cm}$
26. Three friends Pablo, Leonardo and Vincent are talking about an art exhibition, that they are about to visit. Pablo: "There are at least four paintings from Rembrandt at the exhibition." Leonardo: "No, they have at most three of Rembrandt's paintings." Vincent: "There is at least one of his paintings." It turned out that only one of them was right. How many of Rembrandt's paintings are there at the exhibition?

- (A) 0 (B) 1 (C) 2
 (D) 3 (E) 4

27. Points N , M and L lie on the sides of the equilateral triangle ABC , such that $NM \perp BC$, $ML \perp AB$ and $LN \perp AC$ as shown in the diagram. The area of triangle ABC is 36. What is the area of triangle LMN ?



- (A) 9 (B) 12 (C) 15
 (D) 16 (E) 18

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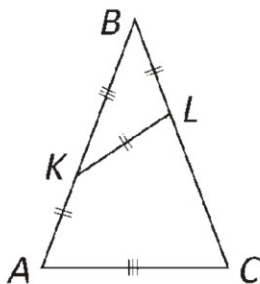
28. Azmi, Burhan and Choo went shopping. Burhan spent only 15 % of what Choo spent. However, Azmi spent 60 % more than Choo. Together they spent 55 USD. How much did Azmi spend?

- (A) 3 (B) 20 (C) 25
(D) 26 (E) 32

29. Viola is practising the long jump. The average distance she has jumped so far today is 3.80 m. On her next jump, she jumped 3.99 m and her average increased to 3.81 m. What distance must she jump with her next jump to increase her average to 3.82 m?

- (A) 3.97 m (B) 4.00 m (C) 4.01 m
(D) 4.03 m (E) 4.04 m

30. In isosceles triangle ABC , points K and L are marked on sides AB and BC respectively so that $AK = KL = LB$ and $KB = AC$. What is the size of angle ABC ?



- (A) 30° (B) 35° (C) 36°
(D) 40° (E) 44°

