

**The University of the West Indies**  
**The 2019 Junior Mathematical Olympiad**

SOLUTIONS FOR FIRST ROUND EXAMINATION, GRADE 4  
WEDNESDAY, FEBRUARY 20, 2019

1. We have  $\frac{16 + 8}{4 - 2} = \frac{24}{2} = 12$ .

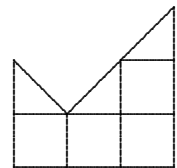
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2. We have

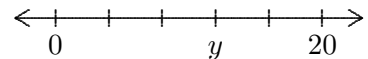
$$\begin{aligned} & (1 + 11 + 21 + 31 + 41) + (9 + 19 + 29 + 39 + 49) \\ &= (1 + 9) + (11 + 19) + (21 + 29) + (31 + 39) + (41 + 49) \\ &= 10 + 30 + 50 + 70 + 90 = 250 \end{aligned}$$

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3. Each triangle is half of a square whose area is 10. So the area of a triangle is 5. Since the figure consists of 4 squares and 3 triangles, the area of the figure is  $4(10) + 3(5) = 40 + 15 = 55$ .



4. The markings on the number line divide it into 5 equal segments. Each segment has a length of 4. Since there are three segments from 0 to  $y$ , The value of  $y$  is 12.



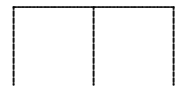
5. We have  $991 + 993 + 995 + 997 + 999 = 4975$ . This is equal to  $5000 - 25$ . Then  $N = 25$ .

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6. We have  $10,000 \div 50 = 200$ . Mikhail has 200 \$50 bills.

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7. Since each square has an area of  $25 \text{ cm}^2$ , the length of a side of a square is 5 cm. The perimeter of the rectangle formed by the squares is  $10 \text{ cm} + 5 \text{ cm} + 10 \text{ cm} + 5 \text{ cm} = 30 \text{ cm}$ .

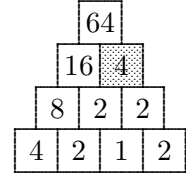


8. The smallest five-digit number is 10,000. The largest four-digit number is 9999. The difference between them is  $10,000 - 9999 = 1$ .

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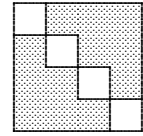
9. The two-digit number Ricky chooses is between 10 and 99 (inclusive). When he subtracts it from 200 the difference is between 101 and 190. When he doubles it, he will get a number between 202 and 380. The largest number Ricky can get is 380.

10. The bottom row consists of the numbers 4, 2, 1, and 2 because  $4 \times 2 = 8$  and  $1 \times 2 = 2$ . The next row consists of 8, 2, and 2 because  $4 \times 2 = 8$ ,  $2 \times 1 = 2$ , and  $1 \times 2 = 2$ . The next row consists of 16 and 4 because  $8 \times 2 = 16$  and  $2 \times 2 = 4$ . The top row, as we know, consists of 64 because  $16 \times 4 = 64$ . The number in the shaded square will be 4.



11. If Julie speaks for one-half hour, she would speak for 30 minutes. At the ideal rate of speech, she would deliver  $30 \times 150 = 4500$  words. If she speaks for three-quarters of an hour, she would speak for 45 minutes. At the ideal rate of speech, she would deliver  $45 \times 150 = 6750$  words. Among the numbers given, the only one between 4500 and 6750 is 5650.

12. Since the large square has a perimeter of 32, the length of one of its sides is 8. The area of the square is  $8 \times 8 = 64$ . Each small square has a side length of 2. The area of a small square is  $2 \times 2 = 4$ . The area of the shaded region is  $64 - (4 + 4 + 4 + 4) = 64 - 16 = 48$ .



13. The numbers from 1 to 46 which are divisible by 3 are

$$\{3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45\}$$

The numbers from 1 to 46 which are divisible by 5 are  $\{5, 10, 15, 20, 25, 30, 35, 40, 45\}$ . The union of these two sets is

$$\{3, 5, 6, 9, 10, 12, 15, 18, 20, 21, 24, 25, 27, 30, 33, 35, 36, 39, 40, 42, 45\}$$

There are 21 numbers which are divisible by either 3 or 5 or both.

14. Other than Luis, there were 9 runners in the race. Since Luis beat 5 persons more than beat him, he finished ahead of 7 runners and behind 2. Luis finished in 3rd place.

15. Since 60 minutes represents one hour, 1000 minutes represents 16 hours and 40 minutes. If the contest started at noon, it ended 16 hours and 40 minutes later. This would be 4:40 am.