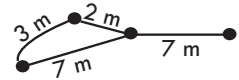
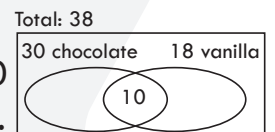


2022 Grade Four Spirit of Math Contest Solutions

- 1) **B** Regroup the numbers to simplify: $79 + 12 - 9 + 18 = 79 - 9 + 12 + 18$
 $= 70 + 30$
 $= 100$
- 2) **D** The pattern is to subtract 5 from each term. The next term is $31 - 5 = 26$.
- 3) **C** The highest score on the graph is 15 on Test 3.
- 4) **B** Since 32 rounds to 30, the sum is $20 + 30 = 50$.
- 5) **A** On the left, $4 \times 3 = 12$. This can be thought of as nine plus some number equals 12. Since $9 + 3 = 12$, the missing number is 3.
- 6) **C** Two cars have $2 \times 4 = 8$ tires and two bicycles have $2 \times 2 = 4$ tires so Kwadwo counted $8 + 4 = 12$ tires.
- 7) **C** The perimeter is the distance around a 2-dimensional shape. Jo's garden is a square, so all four sides are 8 m long. Therefore, the perimeter is $8 + 8 + 8 + 8 = 32$ m.
- 8) **A** The pattern is that the first letter in each pair is a capital letter of the alphabet A, B, C, D, and so on, and the second letter in each pair is a lower case letter of the alphabet in reverse: z, y, x, w, and so on. Therefore, the fourth pair of letters is Dw.
- 9) **C** Manuel reads $3 + 3 = 6$ books per week. In seven weeks he reads $6 \times 7 = 42$ books.
- 10) **A** One hour before 9:30 a.m. is 8:30. Fifteen minutes before 8:30 a.m. is 8:15 a.m. ($30 - 15 = 15$). Therefore, Cybil must arrive at 8:15 a.m.
- 11) **C** In the left side of the diagram, $3 + 2 = 5$ m is less than 7 m, so it is the shorter path. Altogether, the shortest path is $7 + 5 = 12$ m.



- 12) **D** The digit 5 is greater than every digit in the number 203. To make the smallest number, the digit 5 should be in the smallest place value: the ones. Therefore, the digit 5 should be placed at the end of 203.
- 13) **B** Work backwards: Tony's birthday is $20 - 2 + 1 = 19$ (June 19th). Sam's birthday is one week before that, which is $19 - 7 = 12$ (June 12th).
- 14) **D** A) "How many circles are inside the rectangle?" is given in the question.
 B) "What is the circumference of one circle?" does not help solve the problem.
 C) "What is the diameter of each circle?" is given in the question.
 D) "What is the length and width of the rectangle?" asks for the missing information needed to find the area of the rectangle, which brings you closer to solving the problem.
- 15) **B** In total, $12 + 6 = 18$ buried treasures were found among two people. Equally shared, each of them would get $18 \div 2 = 9$ treasures.
- 16) **B** There are $30 + 18 = 48$ customers who ordered chocolate or vanilla, but there are only 38 customers in total. So, $48 - 38 = 10$ customers have been counted twice or 10 customers ordered both.



- 17) **A** Each of 21 people shook hands with 20 other people once. That is $21 \times 20 = 420$ handshakes. However, each handshake is counted twice so the total is $420 \div 2 = 210$.
- 18) **B** Great Granny Greta has 2 suitcases. If each suitcase has 2 backpacks then she has $2 \times 2 = 4$ backpacks. If each backpack has 2 lunch bags then she has $4 \times 2 = 8$ lunch bags. If each lunch bag has 2 candies then she has $8 \times 2 = 16$ candies.

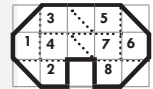
2022 Grade Four Spirit of Math Contest Solutions

- 19) **A** The total number of arrangements for 6 letters is $6!$ but A repeats three times so divide by $3!$: $\frac{6!}{3!} = \frac{6 \times 5 \times 4 \times 3 \times 2 \times 1}{3 \times 2 \times 1}$ which simplifies to $6 \times 5 \times 4 = 120$ ways.
- 20) **D** There are 7 balls in total. There are 2 (red) + 4 (yellow) = 6 balls that are not green. The probability of taking a ball that you take is not green is $\frac{6}{7}$.
- 21) **B** Nico did not read the pages before page 23, so she did not read pages 1 to 22, or 22 pages. Nico read $83 - 22 = 61$ pages.
- 22) **C** Raquel does not like blue, green, or red, so she must like yellow and no one else does. Bennett and Bailey do not like blue, so Gregory must like blue. Bailey does not like red, therefore Bennett's favourite colour is red.
- 23) **C** The amount of days that will pass must be the next number that is a multiple of 10 and 6. Prime factor 10 and 6 to find their least common multiple:

$$\begin{array}{l} 10 = 2 \times 5 \\ 6 = 2 \times 3 \\ \text{LCM} = 2 \times 3 \times 5 \\ = 30 \end{array}$$
 They will play again 30 days after October 21. Ten days after October 21 is October 31 and $30 - 10 = 20$ days later is November 20. They will all play tennis together again on November 20.
- 24) **C** The volume of the cube is $5 \times 5 \times 5 = 125 \text{ m}^3$ and the volume of the prism is $4 \times 4 \times 2 = 32 \text{ m}^3$. The volume of the cube without the prism is $125 - 32 = 93 \text{ m}^3$.
- 25) **C** Add the oranges and bananas together to find the cost of $5 \times 12 = 60$ oranges and 60 bananas, as shown to the right. Therefore 1 banana + 1 orange cost $\$120 \div 60 = \2 .

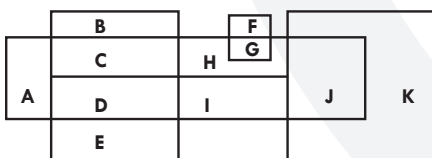
$$\begin{array}{r} 2 \text{ dozen bananas} + 3 \text{ dozen oranges} = \$55 \\ + 3 \text{ dozen bananas} + 2 \text{ dozen oranges} = \$65 \\ \hline 5 \text{ dozen bananas} + 5 \text{ dozen oranges} = \$120 \end{array}$$

- 26) **C** The figure can be cut into 8 pieces as shown in the image to the right.



- 27) **C** In $30 \div 2 = 15$ minutes, Rob can make $12 \div 2 = 6$ pizzas while his assistant can make $12 \div 3 = 4$ pizzas ($45 \div 3 = 15$ minutes). Together, they can make $6 + 4 = 10$ pizzas in 15 minutes. To make 110 pizzas, they need $110 \div 10 = 11$ fifteen minute intervals. They will be finished making the pizzas at $11 \times 15 = 165$ minutes or 2 hours and 45 minutes after 2:30 p.m., which is, which is 5:15 p.m.
- 28) **B** The original number of skiers and snowboarders is 156. The original number of skiers is 62 plus the number of snowboarders. So 156 is equal to 62 plus twice the number of snowboarders. Since $156 - 62 = 94$ is twice the number of snowboarders, there were $94 \div 2 = 47$ snowboarders originally on Math Mountain.
- 29) **A** The numbers in the circle are odd, the numbers in the square are multiples of 3, and the numbers in the triangle are perfect squares. Of the options given, 81 is the only odd perfect square that is a multiple of 3.

- 30) **C** Label each region and make a chart to help you count.



# of Letters	Name	# of Rectangles
1	A, B, C, D, E, F, G, I, J	9
2	BC, CD, DE, DI, FG, HG, JK	7
3	ACD, BCD, CDE, CGH, GHI	5
4	BCDE, GHIJ	2
5	CDGHI	1
6	ACDGHI, CDGHIJ	2
7	ACDHGIJ	1
Total:		27

