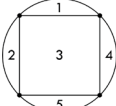


2023 Grade Four Spirit of Math Contest Solutions

- 1) **B** $55 - 45 + 28 + 2 + 20 = 10 + 30 + 20$
 $= 60$
- 2) **B** Each number is 7 more than the number before it, so the next number is $33 + 7 = 40$.
- 3) **D** There are $15 \text{ cookies} \div 3 \text{ cookies per child} = 5$ children.
- 4) **C** The temperature rose 5°C , so it is $-4^\circ\text{C} + 5^\circ\text{C} = 1^\circ\text{C}$ at noon.
- 5) **C** The numbers in order are: $-10, 6, 13, 16, 22$. Therefore 13 is in the middle.
- 6) **A** Putting 1 at the end would make it a palindrome of 14341.
- 7) **A** If she chose the treat that was not the candy cane, she chose the cupcake. Therefore, the other one is the candy cane.
- 8) **D** The square will divide the circle into 5 regions: 
- 9) **B** All of Jason's cars are blue, **except** 4. So $16 - 4 = 12$ cars are blue.
- 10) **B** The number has to be less than 5, since $5^2 = 25$. Between the options given that are less than 5, 4 is the one that works: $4 + 4^2 = 4 + 16$
 $= 20$
- 11) **C** Find the date 2 weeks (or 14 days) before March 17th: $17 - 14 = 3$, so today's date is March 3rd.
- 12) **D** The only word that does not look symmetrical when written in upper-case is NON.
- 13) **A** There are 3 odd numbers on the die (1, 3, and 5). The probability she will roll an odd number is therefore $\frac{3}{6}$, which reduces to $\frac{1}{2}$.
- 14) **C** When I turn 25, my mom will be $25 \times 2 = 50$, so she is 25 years older than me (since $50 - 25 = 25$). That means when I was 5, my mom was $5 + 25 = 30$ years old.
- 15) **D** Six friends gave out 5 cards each: in total $6 \times 5 = 30$ cards were exchanged.
- 16) **C** Ten apples weigh $140 \times 10 = 1400$ grams, which is equivalent to $1400 \div 1000 = 1.4$ kilograms.
- 17) **D** All pets have at least 2 legs: $14 \text{ heads} \times 2 \text{ legs} = 28$ legs. There are $40 - 28 = 12$ legs left, which need to go to the dogs (since dogs have 4 legs). There are $12 \div 2 = 6$ "extra" pairs of legs, which means there are 6 dogs. Therefore, there are $14 \text{ pets} - 6 \text{ dogs} = 8$ birds.
- 18) **D** When the net is folded into a cube, the faces with the triangle, diamond, and x will all end up sharing an edge with the face that has the circle. The one that will be opposite the circle will be the heart.
- 19) **B** The even house before house #14 would be house #12. If the houses were numbered consecutively with both odd and even numbers, there would be $32 - 12 = 20$ houses. Only half of these houses would be even-numbered, so there are $20 \div 2 = 10$ even-numbered houses.
- 20) **B** There are $6!$ ways to rearrange the letters in SPOONS. Since there are two S's and two O's, you need to divide by $2! \times 2!$ to remove the duplicates:

$$\begin{aligned} \frac{6!}{2!2!} &= \frac{6 \times 5 \times \cancel{4}^2 \times 3 \times \cancel{2} \times 1^1}{\cancel{2} \times 1^1 \times \cancel{2} \times 1^1} \\ &= 6 \times 5 \times 2 \times 3 \\ &= 180 \end{aligned}$$

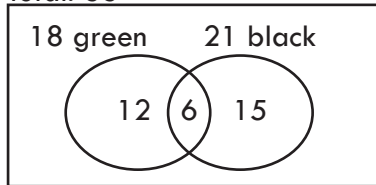


2023 Grade Four Spirit of Math Contest Solutions

- 21) **A** Only A is certain; more people like pepperoni than Hawaiian (so B is not true), and vegan was the least popular pizza choice (so C is not true). D cannot be certain because it's possible that some Grade 4 students had no favourite type of pizza (or more than one!).
- 22) **B** "How many seeds did Lucy plant?" is given in the problem. "How many spaces are there between the first and last seed?" is required to solve this problem. "When did Lucy plant her seeds?" is not relevant to the problem. "How many spaces are there between the first and second seed?" is not helpful.

- 23) **A** Use a Venn diagram to organize the information:

Total: 33

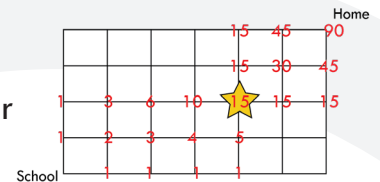


$$15 + 6 = 21 \text{ bracelets with black beads}$$

$$33 - 21 = 12 \text{ bracelets with only green beads}$$

- 24) **B** Crystal leaves at 11:30 AM Toronto time. Five hours later is 4:30 PM Toronto time ($11 + 5 = 16$, and $16 - 12 = 4$). Vancouver time is 3 hours behind, so Crystal's plane lands at 1:30 PM Vancouver time ($4 - 3 = 1$).

- 25) **B** Count the number of ways to each intersection, up to the library. Then from the library, continue counting the number of ways to each intersection until home.



- 26) **A** In Roman numerals, I = 1, V = 5, and X = 10. If a smaller digit comes first, then that smaller digit is subtracted from the digit following it. Following this, XII = 12, IX = 9, and VIII = 8. The multiplication should be done first, so $9 \times 8 = 72$, and $72 + 12 = 84$. Therefore, the equation equals 84.

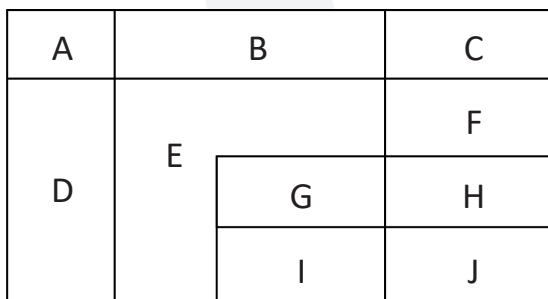
- 27) **C** If Yujin told the truth, that means MJ's statement would also be true. However, only **one** grandchild told the truth. Therefore Alisha told the truth, which means MJ did it.

- 28) **B** Cost of MovieFlix for 8 months: $3 \times \$7 + 5 \times \$10 = \$21 + \$50 = \$71$

MoviesPlus is only \$70, so this will be the least expensive option.

- 29) **C** The red pen (R) is between the purple pen (P) and another pen, so it cannot be farthest left: it must either be second from the left (with P third), or third from the left (with P fourth). Since the green (G) and blue (B) pens are next to each other, R and P have to be third and fourth respectively. Since P is two spots away from the B, B is second from the left, which means G is furthest left: G B R P

- 30) **C** Label each region of the diagram and use a chart to help you keep track:



# of letters	Rectangle Names	# of rectangles
1	A, B, C, D, E, G, H, I, J	9
2	AB, AD, BC, CF, FH, GH, GI, HJ, IJ	9
3	ABC, CFH, EGI, FHJ	4
4	BEGI, CFHJ, DEGI, GHIJ	4
6	ABDEGI, EFGHIJ	2
7	DEFGHIJ	1
8	BCEFGHIJ	1
10	ABCDEFGHIJ	1
Total:		31

