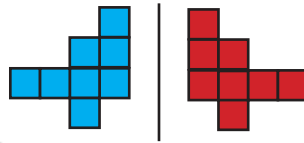


2024 Grade Four Spirit of Math Contest Solutions

- 1) **B** Regroup the numbers to calculate.
$$67 - 14 + 3 - 26 = 67 + 3 - 14 - 26$$
$$= 70 - 40$$
$$= 30$$
- 2) **D** Muhammad has \$135 to share among three food banks, so each food bank receives $\$135 \div 3 = \45 .
- 3) **C** The number of pieces equals the number of parallel cuts + 1. Since Minnie made seven parallel cuts, she cut the hot dog into $7 + 1 = 8$ pieces.
- 4) **B** Written backwards, 789789 becomes 987987. Since these two numbers are not the same, 789789 is not a palindrome.
- 5) **B** A) The number 1461 rounded to the nearest ten is 1460.
B) The number 1467 rounded to the nearest ten is 1470, so there could be 1467 students in the elementary school.
C) The number 1475 rounded to the nearest ten is 1480.
D) The number 1480 is already a multiple of ten.
- 6) **A** Two weeks is equivalent to $2 \times 7 = 14$ days. Fourteen days before June 27th is $27 - 14 = 13$, so today's date is June 13th.
- 7) **C** Tessa chooses to take the one that is not the music class, which means she chooses to take the dance class. Therefore, the other one is the music class.
- 8) **D** According to the graph, Pia is six years old, Leo is ten years old, Shilpa is two years old, and Trinity is nine years old. Since Kevin is eight years old, the average age of all five children is $(6 + 10 + 2 + 9 + 8) \div 5 = 7$ years old.
- 9) **B** All of Nadia's dolls have brown hair except eight who don't have brown hair. Therefore, $21 - 8 = 13$ dolls have brown hair.
- 10) **A** If the first flower is 4 cm tall, then the second flower is $4 + 7 = 11$ cm tall, the third flower is $11 + 7 = 18$ cm tall, and the fourth flower is $18 + 7 = 25$ cm tall. Therefore, the fifth flower is $25 + 7 = 32$ cm tall.
- 11) **D** Alex lives 16 km north of the library and Zane lives 41 km south of the library. Therefore, Alex and Zane live $16 + 41 = 57$ km apart.
- 12) **B** A reflection is a flip over a line. As shown below, when the shape (shaded in red) is flipped over a vertical line, it becomes Option B (shaded in blue).



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- 13) **A** Each plant has at least two vegetables, so there are at least $10 \text{ plants} \times 2 \text{ vegetables} = 20 \text{ vegetables}$. This means that there are still $32 - 20 = 12$ vegetables left. These must be tomatoes because each tomato plant has four vegetables, so each tomato plant still has $4 - 2 = 2$ tomatoes unaccounted for. Since $12 \div 2 = 6$, there are six tomato plants. Therefore, there are $10 - 6 = 4$ pepper plants.
- 14) **A** There are three prime numbers on each die: two, three, and five. Therefore, the probability that Sally will roll a prime number with one die is $\frac{3}{6}$. This reduces to $\frac{1}{2}$.
- 15) **C** The digit 6 is less than the digits 9 and 8 but greater than the digit 3. To make the largest number, the digits should be arranged in order from greatest to smallest. Therefore, the digit 6 should be placed between the 8 and 3.
- 16) **D** All of the numbers that Yuna likes are multiples of three. Of the numbers given, only 30 is a multiple of three.
- 17) **A** Each student demonstrates a chemistry experiment with 14 other students for a total of $15 \times 14 = 210$ experiments. However, each experiment is counted twice, so the total is $210 \div 2 = 105$ experiments.
- 18) **D** A) "Are there any students who never use their lockers?" is not relevant to the problem.
 B) "How many lockers are there in total in Fei's high school?" is given in the question.
 C) "How many odd numbers are there between 1 and 78?" is helpful, but it is not the best logical question.
 D) "How many odd numbers between 1 and 78 are divisible by 3?" helps determine the number of multiples of three between 1 and 78, which helps determine the number of students in Fei's homeroom class.
- 19) **C** In three games, Vladimir scored $3 \times 11 = 33$ points in total. He needs a total of $4 \times 13 = 52$ to achieve an average of 13. Therefore, he will need to score $52 - 33 = 19$ points in his fourth game to achieve an average of 13.
- 20) **A** In this secret code, each letter is represented by the number representing its numerical place in the alphabet. For example, A becomes 1, B becomes 2, and Z becomes 26. Using this knowledge, the following table can be constructed.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

According to the table, the word VIOLIN is represented by the series of numbers 22.9.15.12.9.14.



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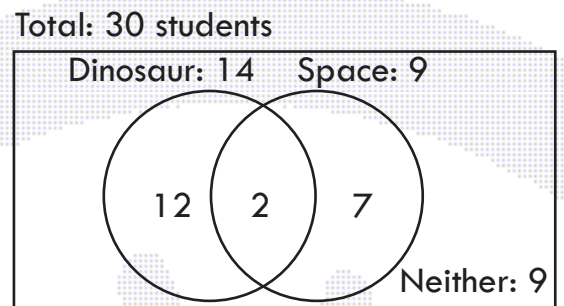
21) **C** 0.75 hours or three-quarters of an hour is equal to 45 minutes. This means that in 3.75 hours, there are $3 \times 60 + 45 = 225$ minutes. Therefore, Frederica will be able to bake $(225 \div 25) \times 12 = 108$ cupcakes.

22) **A** Cost of Connect+ for 11 months:
 $5 \times \$10 + (6 \div 2) \times \$9 = \$50 + 3 \times \9
 $= \$50 + \27
 $= \$77$

Since Phones+ costs \$80, Connect+ is the least expensive option.

23) **D** The rectangle is divided into five identical pieces, two of which are shaded. The area of two shaded pieces is equal to $7 u^2$, so the area of one piece is $7 \div 2 = 3.5 u^2$. Therefore, the area of five pieces or the entire rectangle is $5 \times 3.5 = 17.5 u^2$.

24) **C** Use a Venn diagram to solve this problem. If two students visited both exhibits, then $14 - 2 = 12$ students only visited the dinosaur exhibit and $9 - 2 = 7$ students only visited the space exhibit. Therefore, $30 - 12 - 7 - 2 = 9$ students visited neither of these exhibits.



25) **D** Solve using order of operations.
 $16 + 32 \div (7 - \sqrt{9})^2 = 16 + 32 \div (7 - 3)^2$
 $= 16 + 32 \div 4^2$
 $= 16 + 32 \div 16$
 $= 16 + 2$
 $= 18$

26) **B** Make an organized chart. The number of pages in the first book is not divisible by 5, so it cannot be red or green. The number of pages in the third book is a perfect square, so it must be red since 100 is the perfect square of 10. Since the second book is not green or blue, it becomes clear that the green book can only be in the fourth spot. Therefore, the colour of the fourth book is green.

	Red (100 Pages)	Yellow (79 Pages)	Green (120 Pages)	Blue (68 Pages)
First	X	X	X	✓
Second	X	✓	X	X
Third	✓	X	X	X
Fourth	X	X	✓	X



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- 27) **B** The number of days that will pass must be the next number that is a multiple of both 12 and 15. Prime factor 12 and 15 to find their least common multiple.

$$12 = 2^2 \times 3$$

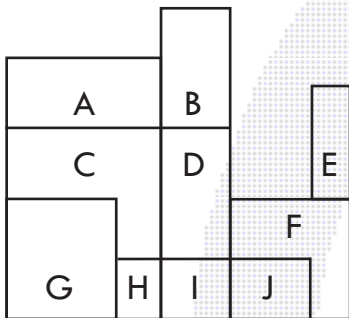
$$15 = 3 \times 5$$

$$\text{LCM} = 2^2 \times 3 \times 5$$

$$= 60$$

Therefore, Oliver and Olivia will both go to the local farmer's market 60 days after the seventh day of the new year. This is equal to the $7 + 60 = 67^{\text{th}}$ day of the new year.

- 28) **D** Since Dean does not want to visit England first, he has three choices for the first stop of his vacation: France, Italy, or Spain. For each of these three choices, he has the remaining three countries as choices for the second stop of his vacation, the remaining two countries as choices for the third stop of his vacation, and the one remaining country as the only choice for the final stop of his vacation. Therefore, there are $3 \times 3 \times 2 \times 1 = 18$ different ways that Dean can travel across Europe.
- 29) **A** Tom must be 16, 20, or 24 years old because these are the only multiples of four between 15 and 25. Therefore, Jerry must be 4, 5, or 6 years old. In three years, Tom will be 19, 23, or 27 while Jerry will be 7, 8, or 9. Both 19 and 7 are prime numbers, so Jerry is 4 years old now.
- 30) **C** Label each region of the diagram and make a chart to help you count.



# of Letters	Name	# of Rectangles
1	A, B, D, E, G, H, I, J	8
2	BD, DI, FJ, HI, IJ	5
3	BDI, CGH, HIJ	3
4	ACGH	1
5	CDGHI	1
Total		18