2022 Team Up Challenge

Team Paper


💡 **Tips to Get Started**

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- The questions in this paper increase in difficulty as you move through the paper. The last few questions require some careful thought.

- Each team member doesn't need to do every question. You can split the questions up, work together, or do a combination of both. Come up with a strategy that works for your team.

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1. When the numbers 3.1, 3.001, 3.0001, 3.01, and 3.0000001 are arranged from least to greatest, what is the middle number?

2. A *line of symmetry* passes through the centre of a shape and divides the shape into two halves so that one half is the reflection of the other half.

   In the diagram, a square is divided into nine identical smaller squares, and six of these smaller squares are shaded. How many lines of symmetry does the diagram have?
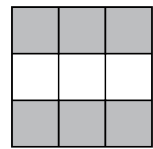
3. Consider the following flowchart. Rosa inputs a number and gets an output of 17. What number did she input?

   Input → Multiply by 5 → Subtract 6 → Divide by 2 → Output
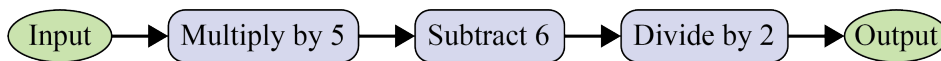
4. Four points are placed on a grid, as shown. If each small square in the grid has an area of 1 square unit, which three points are the vertices of a triangle with an area of 3 square units?
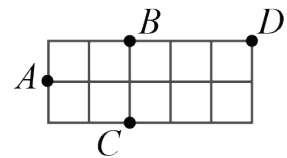
5. Toby sold hats for a school fundraiser. The hats came in four sizes: S, M, L, and XL, which stand for small, medium, large, and extra large, respectively. Toby's sales for sizes S, M, and L are shown in the bar graph. If half of the total number of hats Toby sold were size L, how many size XL hats did Toby sell?
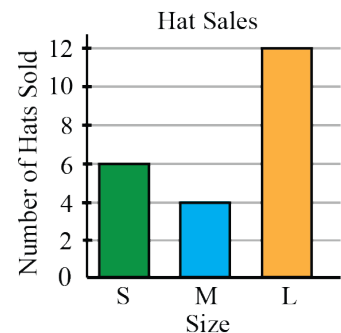
6. Seth has seven potted plants on his windowsill, three of which have flowers. The plants are initially in the following order:

Seth rearranges the plants by swapping the positions of two adjacent plants. He does several swaps until the three flowering plants are next to each other. What is the fewest number of swaps that Seth could have done?

7. The number of even integers between 1 and 53 is the same as the number of odd integers between 12 and n, where n is a positive even integer. What is the value of n?

8. Chance the chipmunk is collecting acorns. On each trip, he can visit one tree and collect up to 11 acorns before returning to his burrow. He may return to the same tree more than once. The initial number of acorns below each tree is given.


31   3   35   28   26
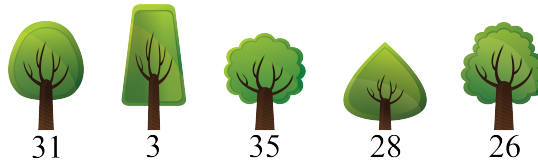
What is the maximum number of acorns that Chance can collect in 10 trips?

9. In the diagram, a 4×4 grid is to be filled so that each of the digits 1, 2, 3, and 4 appears exactly once in each row and each column. The 4×4 grid is divided into four smaller 2×2 squares. Each of these 2×2 squares is also to contain each of the digits 1, 2, 3, and 4. What digit replaces D?

| 2		4	
	3		
	D		
			1

10. The three equal-arm scales shown are balanced, meaning the left side and the right side of each scale have equal mass.
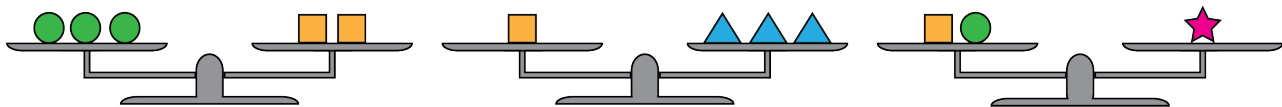
If ★ has a mass of 10 grams, what is the mass, in grams, of ▲?

11. Suraj wrote a program, using block coding, to change the orientation of a square face. One block in Suraj's code is missing. His code, as well as the actions performed by three of the blocks he used, are shown.
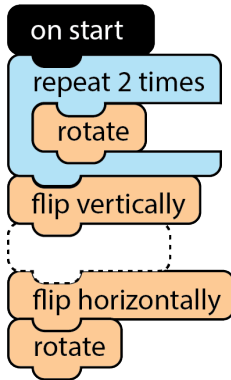
| Block Name	Action Performed
flip vertically	
flip horizontally	
rotate	

If Suraj wants his square face to end up in the same orientation that it started in, which block should he put in the blank spot?

12. A block of cheese is in the shape of a rectangular prism with side lengths of 6 cm, 7 cm, and 8 cm. Raissa cuts a cube out of one corner of the block of cheese. If the volume of the remaining cheese is 309 cm^3, what is the side length, in centimeters, of the cube Raissa cut out?

6 cm

7 cm

8 cm
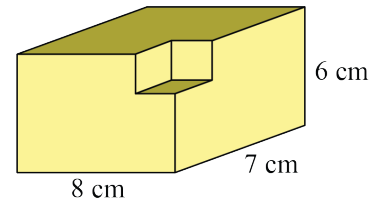
13. Anil has a lock that requires a four-digit code to open it, but Anil has forgotten his code! He remembers that the digits in his code are 1, 4, 8, and 8, but he can't remember the order that they go in. It takes Anil 5 seconds to try one code and he keeps trying different codes until he gets the right one. What is the longest amount of time, in seconds, it could possibly take Anil to open the lock?

14. Mirela and Kumara make and sell friendship bracelets. In total they have made 390 bracelets, and 90% of them have been sold. If 207 of Kumara's bracelets have been sold and 80% of Mirela's bracelets have been sold, how many bracelets has Mirela made in total?

15. When the sum of a set of integers equals zero, we call that set a *nada set*. A nada set must contain at least one integer. For example, the integers -2 and 2 form a nada set because $(-2) + 2 = 0$. Also, the integers $-6, -3$, and 9 form a nada set because $(-6) + (-3) + 9 = 0$.

Elise has eight cards, each with a different integer on it, as shown.

-1	5	6	-8	2	-11	-3	10
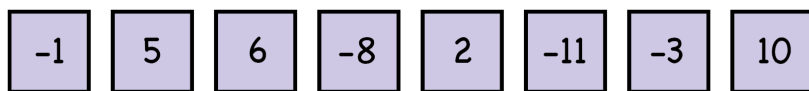
Using the integers on these cards, how many different nada sets can Elise make?

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Team Paper Answer Sheet

Team: _____

Question	Answer
1	
2	
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15	