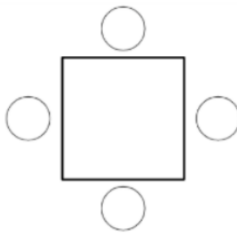# Elementary School Division
Algebra & Probability Group Round

15 minutes 20 questions

Instructions

– Do not turn over this test until you are instructed to begin.

– Write your answers on the separate answer sheet.

– Express all of your answers in simplified form.

– Do not include units.

#	Problems
1	Let's play a game! 1. Pick a number between 1 and 25. 2. Add 9 to it. 3. Multiply the result by 3. 4. Subtract 6. 5. Divide by 3. 6. Subtract your original number. What number do you have?
2	If $(4 + x) + (5 + x) + (6 + x) = 60$, what is the value of x?
3	When paper strip a with a length of 23 inches is attached onto paper strip y, the new strip of paper has a length of 31 inches. If the length of the overlapping part is 2 inches, how long is paper strip y?
4	Anna can finish 2 pages of her summer homework in 1 hour. How many pages can she finish in 2 hours?
5	According to the poster on a printing shop, it costs $1 to print each page. However, they offer a $20 discount to customers who print more than 500 pages. John is planning to print less than 500 pages, but he realized that the total cost would be cheaper if he printed 500 pages. What is the minimum possible number of pages John is planning to print?
6	Eva made a sugar solution with 20g of sugar and 100g of water. She then added 5g of sugar into the solution. What fraction of the solution is sugar?
7	Car A and Car B are on different ends of the road. Car A is driving toward Car B at 60 mph, and Car B is driving toward Car A at 40 mph. If the cars are 200 miles apart, how many hours will it take for them to meet each other?
8	A card is randomly drawn from a standard 52-card deck. What is the probability that it is a red card?
9	There are two times more blue candies than green candies in a bag. What is the probability of picking out a blue candy?
10	We have two positive integers x and y such that $x + y = xy = 4$. What is $2x/y$?
11	Bill has 4 red socks, 5 pink socks, 9 black socks, and 17 purple socks. What is the minimum number of socks Bill needs to pull from his sock closet to guarantee that he has at least one pair of matching socks?
12	Eric wants to walk to the train station. The distance between his house and the train station is 8 cm on a map with a scale of 1 : 25000. How many meters will Eric have to walk?

13	The teacher is calculating the average score of each row in his classroom. In a row where there are 5 students sitting, the first three students' average score is 83, while the last two students' average score is 77. What is the average score of this row?
14	What is the next number in the sequence $3, 6, 10, 15, 21, \underline{\quad}$?
15	A bottle of soda costs \$20. The soda costs \$19 more than the empty bottle. How much does the empty bottle cost?
16	According to the directions on a bottle of liquid laundry detergent, the amount detergent used each time should be 1/3 of the cap. However, Katie mistakenly read it as 1/2 of the cap. When she realized this, she had already used the detergent 12 times. Following the correct instructions, it took her 15 more times to finish off the bottle of detergent. How much detergent is in the bottle (in caps)?
17	The plan for a tree planting event was to plant 20 trees per hour. However, during the actual event, 8 more trees were being planted per hour. If the event lasted 2 hours, many trees were planted during the event?
18	Charlie created a new @ operator. It is defined as $a@b = 6a + 5b$. What is 20@5?
19	Emily and Thomas have homework. Emily finishes each page in 20 minutes, and Thomas finishes each page in 40 minutes. They decide to work together to finish the 6 total pages. How many minutes will it take for them to finish?
20	Laura, her brother, and their parents are dining at a restaurant. The arrangement of their seats is shown in the diagram below. If they pick their seats randomly, what is the probability that Laura sits to the left of her brother?