



Practise this type in the Karotto app, with questions read aloud and hints when stuck. Scan the code or visit playkarotto.com

Logic

Standing in line

- 1 In a line, counting from the front, the puppy is number 13 and the piglet is number 26. How many friends stand between them?



Answer: _____

Who is the tallest

- 2 We know that the chick is taller than the piglet, the bunny is taller than the chick, the puppy is shorter than the piglet. Who is the tallest?

☐ A puppy ☐ B bunny ☐ C chick ☐ D piglet

Answer: _____

How many in the family

- 3 The bear cub's parents have 6 children, including 3 girls. The bear cub is a boy. How many brothers does the bear cub have?



Answer: _____

Balance scales

- 4 1 egg weighs the same as 5 flowers, 1 mushroom weighs the same as 3 eggs. 1 mushroom weighs the same as how many flowers?



Answer: _____

Adding or taking the same each time

- 5 Find the pattern, then fill in the missing number in the empty box.

114 118 ? 126 130

Answer: _____

Which picture comes next

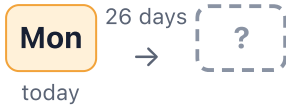
- 6 The pictures keep repeating in the pattern shown below. How many apples are in the first 19 pictures?



Answer: _____

Yesterday, today, tomorrow

- 7 Today is Monday. What day will it be in 26 days?



today

- (A) Monday (B) Wednesday (C) Friday (D) Saturday

Answer: _____

Letter patterns

- 8 These letters follow a pattern. Which letter goes in the empty box?



- (A) R (B) Q (C) P (D) U

Answer: _____

Mystery number table

- 9 In each row, the third number is made from the first two in the same way. Find the number for the question mark.

8 5 26

11 5 32

7 12 

Answer: _____

Arithmetic

Quick calculating

- 10 Work it out quickly, then fill in the answer in the empty box.

$$15 + 15 + 15 + 15 - 15 - 15 = \boxed{}$$

Answer: _____

What number goes in the box

- 11 What number goes in the empty box?

$$36 + \boxed{} = 46 + 23$$

Answer: _____

Pictures for numbers

- 12 Each kind of picture stands for a number. What number is the corn cob?

$$\text{🍄} + \text{🍄} = 42$$

$$\text{🍄} + \text{🌽} = 49$$

$$\text{🌽} = \boxed{}$$

Answer: _____

Sharing to make it equal

- 13 At first, the bunny has 64 eggs and the kitten has 34 eggs. How many eggs must the bunny give the kitten so they both have the same number of eggs?



Answer: _____

Age puzzles

- 14 This year, the ages of the fox and the puppy add up to 28. What will their ages add up to in 7 years?



Answer: _____

Counting animal legs

- 15 In the yard there are 3 hens and 8 dogs. How many legs are there in all?



Answer: _____

Planting trees and sawing logs

- 16 Along a road 136 metres long, a tree is planted every 8 metres, with a tree at both ends. How many trees are there in all?



Answer: _____

Fill in plus and minus

17 Put a plus or a minus sign in each empty box to make the sum correct. Choose the right signs.

16 8 16 10 11 = 3

- (A) + - + + (B) - + - - (C) + + + - (D) + + + +

Answer: _____

Letter sums

18 Each letter stands for a digit. Different letters are different digits. Fill in the empty box.

AA + AB = 45

AB =

Answer: _____

Sharing so no one gets the same

19 Share all 26 stars among 3 children. Everyone gets some, and no two children get the same number. At most how many can the child with the most get?



Answer: _____

Evening out for three friends

20 At first, the piglet has 18 mushrooms, the kitten has 3 mushrooms and the fox has 6 mushrooms. The piglet gives some to the kitten and the fox so that all three have the same number of mushrooms. How many mushrooms must the piglet give the fox?



Answer: _____

More than and times as many

21 The frog has 3 times as many carrots as the bear cub. The frog has 6 more carrots than the bear cub. How many carrots does the bear cub have?

frog			
bear cub			

Answer: _____

Number Theory

Counting numbers

22 How many numbers are bigger than 103 and smaller than 207?

Answer: _____

Even or odd

- 23 Is the answer to this sum even or odd?

$$15 + 26 + 26 + 3$$

☐ A Even ☐ B Odd

Answer: _____

Tens and ones

- 24 How many two-digit odd numbers are there?

Answer: _____

Which term of the sequence

- 25 The numbers go 8, 14, 20, 26, ... Which number is in position 13?

8 14 20 26 ... ?

Answer: _____

Counting digits

- 26 Write the numbers from 1 to 84. How many times do you write the digit 7?

Answer: _____

Making numbers from digits

- 27 Use the digits 8, 0, 9, 7, each one at most once. What is the smallest number with 2 digits you can make?

8 0 9 7

Answer: _____

Adding up the digits

- 28 Find the smallest number with 2 digits whose digits add up to 7.

Answer: _____

Two numbers from four digits

- 29 Use all four digits 4, 9, 7, 3, each one once, to write two 2-digit numbers. What is the smallest possible sum of the two numbers?

4 9 7 3

Answer: _____

Divisible by both numbers

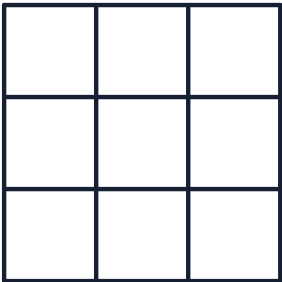
- 30 From 1 to 35, how many numbers can be divided exactly by both 3 and 5?

Answer: _____

Geometry

Counting squares

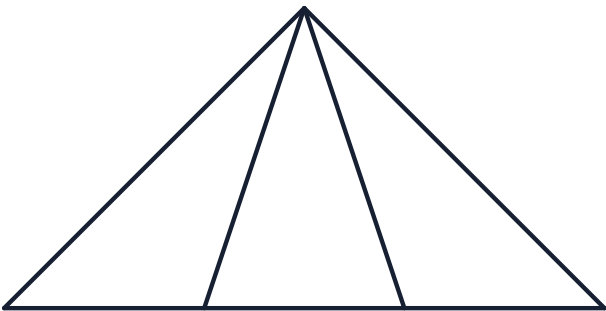
31 How many squares are there in the picture in all?



Answer: _____

Counting triangles

32 How many triangles are there in the picture in all?



Answer: _____

Counting line segments

33 The picture has 4 points, and no three of them are on the same straight line. What is the most straight lines you can draw, each going through two points?



Answer: _____

Counting rectangles

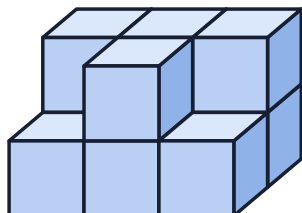
- 34** How many rectangles are there in the picture in all? Squares count as rectangles too.



Answer: _____

Counting cubes

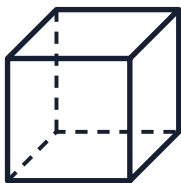
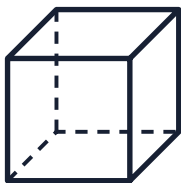
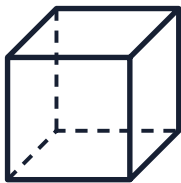
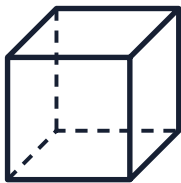
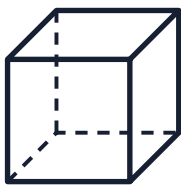
- 35** How many cubes are in the picture? A cube on top always has a cube under it.



Answer: _____

How many sides and corners

36 There are 5 cubes standing apart. How many corners do they have in all?



Answer: _____

Matchstick shapes

37 Making 2 squares in a row like in the picture takes 7 matchsticks. How many matchsticks do you need for 4 squares in a row like this?



Answer: _____

Cutting cakes, drawing lines

- 38 You cut a round cake with 7 straight cuts, and every cut goes through the middle. How many pieces do you get?



Answer: _____

Combinatorics

How many ways to choose

- 39 Bunny has 6 shirts and 5 pairs of pants. How many ways can Bunny pick 1 shirt and 1 pair of pants to wear?



Answer: _____

How many numbers can you make

- 40 Using the digits 7, 2, 0, how many numbers with 2 different digits can you make?

7 2 0

Answer: _____

Which number is the k-th largest

- 41 Which is the biggest of the numbers 183, 813, 318, 138, 381?

183 813 318 138 381

Answer: _____

Ways to share sweets

- 42 Split 8 into two numbers that add up to it, and 0 is allowed. Swapping the two numbers counts as the same way. How many ways are there?



Answer: _____

Handshakes

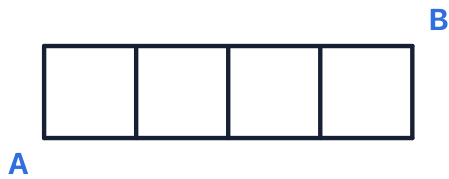
- 43 There are 7 friends, and each friend gives a card to every other friend. How many cards are there in all?



Answer: _____

Counting paths

- 44 Follow the lines. Each step can only go right or up. How many ways are there to go from A to B?



Answer: _____

Coin combinations

- 45 How many ways can you make 10 coins using coins worth 1, 2, 5? You can take any number of each kind, and the order doesn't matter.



Answer: _____

Picking marbles to be sure

- 46 A box has 2 red marbles and 9 blue marbles. Without looking, what is the smallest number of marbles you must take out to be sure to get 1 red marble?



Answer: _____

Making even and odd numbers

- 47 Using the digits 3, 1, 6, 0, how many numbers with 2 different digits can you make that can be divided exactly by 5?

3 1 6 0

Answer: _____

Choosing and giving prizes

- 48 5 children run a race, and nobody finishes at the same time. How many ways can you give out one first prize and one second prize?



Answer: _____

Paying with coins

- 49 You have coins marked 2, 5, 5, 10. Without getting change, how many different amounts can you pay exactly?



2 5 5 10

Answer: _____

Answers and solutions

1. Answer: 12 · Standing in line

How to think: Don't count the two friends at the ends.

Solution: 26 minus 13 equals 13. We don't count number 26, so 13 minus 1 equals 12 friends in between.

2. Answer: bunny · Who is the tallest

How to think: Line the friends up from tallest to shortest.

Solution: From tallest to shortest: bunny, chick, piglet, puppy. So it's the bunny.

3. Answer: 2 · How many in the family

How to think: The bear cub's brothers are the other boys in the family, not the bear cub.

Solution: Don't count the bear cub: 3 minus 1 equals 2.

4. Answer: 15 · Balance scales

How to think: Swap each thing for the lighter one, one step at a time.

Solution: 1 mushroom weighs the same as 3 eggs, and each of those weighs the same as 5 flowers. So 1 mushroom weighs the same as 3 times 5, that is 15 flowers.

5. Answer: 122 · Adding or taking the same each time

How to think: Look at each pair of numbers side by side. How much bigger or smaller is the next number?

Solution: The step into the empty box adds 4: 118 plus 4 equals 122. Check: 122 plus 4 equals 126.

6. Answer: 5 · Which picture comes next

How to think: Find how many pictures it takes to start over. Circle one group.

Solution: 4 groups have 4 times 1, which is 4. The leftover pictures add 1 more. In all: 4 plus 1 equals 5.

7. Answer: Saturday · Yesterday, today, tomorrow

How to think: Every 7 days, you come back to the same day of the week.

Solution: Go 5 days more: Tuesday, Wednesday, Thursday, Friday, Saturday. So in 26 days, it will be Saturday.

8. Answer: Q · Letter patterns

How to think: Say the alphabet A, B, C, D, E... and count how many steps apart the letters are.

Solution: The steps keep growing: 1, 2, 3. Next we go forward 4 steps: 4 steps after M is Q.

9. Answer: 38 · Mystery number table

How to think: Look at the first row: how do the first two numbers make the third? Try adding, taking away, multiplying.

Solution: Row one: (8 plus 5) times 2 equals 26. Row two: (11 plus 5) times 2 equals 32. So row three: (7 plus 12) times 2 equals 38.

10. Answer: 30 · Quick calculating

How to think: All the numbers are 15. Count how many times 15 is left in the end.

Solution: That leaves 2 times 15, which is 30.

11. Answer: 33 · What number goes in the box

How to think: Work out the side to the right of the equals sign first.

Solution: The right side equals 69. 69 minus 36 equals 33.

12. Answer: 28 · Pictures for numbers

How to think: Start with the line that has only one kind of picture.

Solution: We see that the mushroom is 21, so the corn cob is 49 minus 21 equals 28.

13. Answer: 15 · Sharing to make it equal

How to think: First: how many more eggs does the bunny have than the kitten?

Solution: The extra is 30 eggs. Give your friend half: half of 30 is 15. Then each friend has 49 eggs.

14. Answer: 42 · Age puzzles

How to think: Each year, each friend gets 1 year older.

Solution: Each friend gets 7 years older, so together they add 7 plus 7 equals 14. The total is 28 plus 14 equals 42.

15. Answer: 38 · Counting animal legs

How to think: Each hen has 2 legs, and each dog has 4 legs.

Solution: 3 hens have 6 legs, 8 dogs have 32 legs. In all: 6 plus 32 equals 38 legs.

16. Answer: 18 · Planting trees and sawing logs

How to think: First count the gaps: each gap is 8 metres long.

Solution: A road of 136 metres splits into 17 gaps of 8 metres, so there are 17 plus 1 equals 18 trees.

17. Answer: - + - - · Fill in plus and minus

How to think: Try each set of signs and work from left to right to see if you get the answer.

Solution: We fill in: 16 minus 8 plus 16 minus 10 minus 11 equals 3. Work from left to right: 16, 8, 24, 14, 3.

18. Answer: 23 · Letter sums

How to think: AA is a two-digit number with two digits the same, like 33. Try each digit for A.

Solution: If A is 2: 22 plus 20 equals 42. We still need 3 more, so B is 3. If A were 3, 33 plus 30 would be 63, already more than 45. So AB is 23.

19. Answer: 23 · Sharing so no one gets the same

How to think: The children must get different numbers. Try lining them up from fewest to most.

Solution: The other 2 get as few as possible: 1, 2, that is 3 in all. The last child gets 26 minus 3, which is 23.

20. Answer: 3 · Evening out for three friends

How to think: At the end, all three have the same. Put everything together and share it equally among 3 friends.

Solution: Together they have 18 plus 3 plus 6 equals 27. Shared among 3: 27 divided by 3 equals 9. The fox has 6, so needs 9 minus 6 equals 3 more.

21. Answer: 3 · More than and times as many

How to think: Draw a bar model: the bear cub has 1 part, the frog has 3 parts of the same size.

Solution: The frog has 3 parts, the bear cub has 1 part, so the difference is 2 parts. 2 parts are 6, so 1 part is 3. So the bear cub has 3 carrots.

22. Answer: 103 · Counting numbers

How to think: Don't count 103 or 207.

Solution: 207 minus 103 equals 104. We don't count 207, so 104 minus 1 equals 103 numbers.

23. Answer: Even · Even or odd

How to think: You don't need to work out the whole sum. Just count how many odd numbers there are.

Solution: There are 2 odd numbers. They pair up with none left over, so the answer is even.

24. Answer: 45 · Tens and ones

How to think: Odd numbers end in 1, 3, 5, 7 or 9.

Solution: Each ten has 5 odd numbers. There are 9 tens, from 1 to 9: 9 times 5 equals 45.

25. Answer: 80 · Which term of the sequence

How to think: How many steps is it from the first number to position 13?

Solution: There are 12 steps, each adding 6: 12 times 6 equals 72. 8 plus 72 equals 80.

26. Answer: 18 · Counting digits

How to think: Count the ones place first, then the tens place.

Solution: Ones place: 8 times, tens place: 10 times. 8 plus 10 equals 18 times.

27. Answer: 70 · Making numbers from digits

How to think: Put the smallest digit first, but it can't be 0.

Solution: The first digit is 7, then the other digits go from smallest to biggest: you get 70.

28. Answer: 16 · Adding up the digits

How to think: For the smallest number, the first digit must be as small as possible.

Solution: The smallest first digit possible is 1, so the number is 16.

29. Answer: 86 · Two numbers from four digits

How to think: A digit in the tens place is worth 10 times as much as in the ones place. Which digits go in the tens place?

Solution: The two smallest digits 3, 4 go in the tens place, and 7, 9 go in the ones place: 37 plus 49 equals 86.

30. Answer: 2 · Divisible by both numbers

How to think: List the numbers you can divide exactly by 5, then find one you can also divide by 3.

Solution: The smallest number you can divide by both 3 and 5 is 15. The numbers are 15, 30. That makes 2.

31. Answer: 14 · Counting squares

How to think: Count the small 1-box squares first, then the 4-box squares, the 9-box squares...

Solution: Count from small to big: 9 plus 4 plus 1 equals 14 squares.

32. Answer: 6 · Counting triangles

How to think: Count the 1-part triangles first, then the triangles made of 2 parts, 3 parts...

Solution: Count the triangles of 1 part, 2 parts, 3 parts...: 3 plus 2 plus 1 equals 6 triangles.

33. Answer: 6 · Counting line segments

How to think: Each straight line goes through exactly two points. Start at one point and draw lines to the other points.

Solution: Each point adds its new lines: 3 plus 2 plus 1 equals 6 straight lines. Just like the handshake problem!

34. Answer: 15 · Counting rectangles

How to think: Count the 1-box shapes, then the shapes made of 2 boxes, 3 boxes...

Solution: Count the shapes of 1 box, 2 boxes, 3 boxes...: 5 plus 4 plus 3 plus 2 plus 1 equals 15 shapes.

35. Answer: 10 · Counting cubes

How to think: Count column by column, and remember the hidden cubes underneath.

Solution: Add up the cubes in each column: 2 plus 2 plus 2 plus 1 plus 2 plus 1 equals 10 cubes.

36. Answer: 40 · How many sides and corners

How to think: How many corners does one cube have? The cubes are apart, so they share no corners.

Solution: Each cube has 8 corners, and there are 5 cubes: 5 times 8 equals 40 corners.

37. Answer: 13 · Matchstick shapes

How to think: The first square needs 4 sticks. Each next square shares 1 stick with the one before it.

Solution: The first square needs 4 sticks, and the 3 squares after it need 3 more each: 4 plus 3 times 3 equals 13 sticks.

38. Answer: 14 · Cutting cakes, drawing lines

How to think: The first cut makes 2 pieces. How many more does each new cut add?

Solution: Each cut through the middle gives 2 pieces. 7 cuts give 2 plus 2 plus 2 plus 2 plus 2 plus 2 plus 2, which is 14 pieces.

39. Answer: 30 · How many ways to choose

How to think: Try matching each shirt with every pair of pants.

Solution: Each shirt goes with 5 pairs of pants, and there are 6 shirts: 6 times 5 equals 30 ways.

40. Answer: 4 · How many numbers can you make

How to think: 0 can't be the first digit. Choose the first digit first.

Solution: The first place has 2 choices, the next has 2: 2 times 2 equals 4 numbers.

41. Answer: 813 · Which number is the k-th largest

How to think: Compare the first digits first. If the first digits are the same, compare the next digits.

Solution: From biggest to smallest: 813, 381, 318, 183, 138. The number in place 1 is 813.

42. Answer: 5 · Ways to share sweets

How to think: List them in order: the first number is 0, then 1, then 2. Stop when the pairs start to repeat.

Solution: The ways are: 0 plus 8, 1 plus 7, 2 plus 6, 3 plus 5, 4 plus 4. That makes 5 ways.

43. Answer: 42 · Handshakes

How to think: Each friend gives cards to the 6 other friends.

Solution: There are 7 friends, and each one gives 6 cards: 7 times 6 equals 42 cards.

44. Answer: 5 · Counting paths

How to think: Points on the bottom edge and on the left edge have only 1 way to get there.

Solution: Write the number of ways at each point: each point is the point on its left plus the point below. There are 5 ways to reach B.

45. Answer: 10 · Coin combinations

How to think: Start by using as many coins worth 5 as you can.

Solution: List them one by one, starting with the most coins worth 5, without missing any: there are 10 ways.

46. Answer: 10 · Picking marbles to be sure

How to think: Think of the unluckiest case: the marbles you take out are never the ones you want.

Solution: The unluckiest case: you take out all 9 blue marbles first, then the next one is sure to be red: 9 plus 1 equals 10 marbles.

47. Answer: 3 · Making even and odd numbers

How to think: A number you can divide exactly by 5 ends in 0 or 5. Choose the ones digit first.

Solution: A number you can divide exactly by 5 ends in 0 or 5. The numbers are: 10, 30, 60. That makes 3 numbers.

48. Answer: 20 · Choosing and giving prizes

How to think: Which of the 5 children could win first prize?

Solution: First prize has 5 choices. For each one, second prize has 4 choices: 5 times 4 equals 20 ways.

49. Answer: 9 · Paying with coins

How to think: Try paying with one coin, then two coins, then three. Write down each amount.

Solution: The amounts you can pay are 2, 5, 7, 10, 12, 15, 17, 20, 22. An amount you can make two ways counts only once. That makes 9 amounts.
