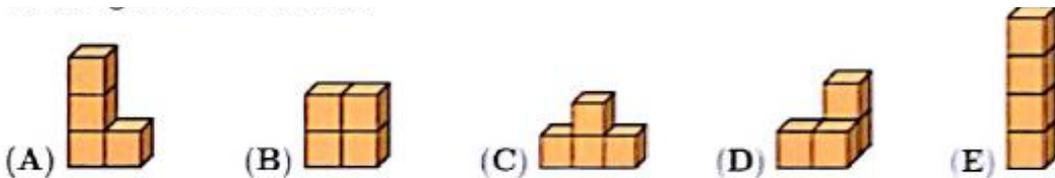
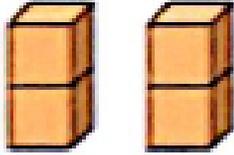


Math Kangaroo Review

1. Don has two identical bricks (see picture). Which figure can he not build using these two bricks?



C

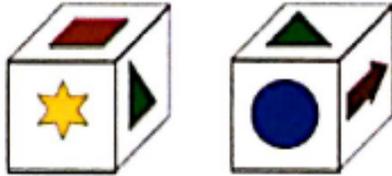
2. A ship was attacked by pirates. One by one, the pirates climbed a rope to get to the ship. The pirate captain was the 2015th pirate to climb, and there were as many pirates in front of him as behind him. How many pirates climbed the rope?

$$2014 + 1 + 2014 = \mathbf{2029}$$

3. One of the six stickers shown below was placed on each of the six faces of a die.



This next picture shows the die in two positions.



Which picture is on the face opposite the face with the kangaroo sticker?

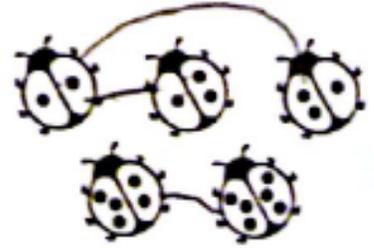


B

4. Joseph has 5 toys: a car, an airplane, a ball, a ship, and a rowboat. He wants to put them all in a row on a shelf. Both the ship and the airplane have to be next to the car. In how many ways can he arrange the toys so that this condition is fulfilled?

12

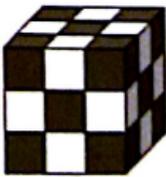
5. There are 5 lady bugs (see picture).
Two ladybugs are friends with each other only if the numbers of spots that they have differ exactly by 1.



On Sunday, each of the ladybugs sent one text greeting to each of her friends. How many text greetings were sent?

$$3 \times 2 = 6$$

6. Jack built a cube using 27 small cubes which are colored either gray or white (see picture below). No two of the small cubes which are the same color have a common face. How many white cubes did Jack use?



$$13$$

7. We can fill a certain barrel with water if we use water from 6 small pitcher, 3 medium pitchers and one large pitcher, or from 2 small pitchers, 1 medium pitcher and 3 large pitchers. If we use only large pitchers of water, how many of them do we need to fill the barrel?

Let s =small, m =medium, l =large

$$6s + 3m + 1l = 2s + 1m + 3l$$

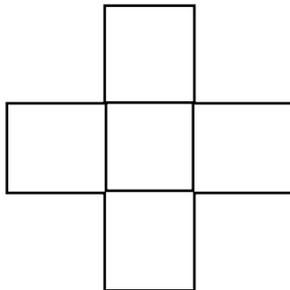
$$3(2s + 1m) + 1l = (2s + 1m) + 3l$$

$$2(2s + 1m) = 2l$$

$$2s + 1m = 1l$$

4 large

8. The numbers 2, 3, 5, 6, and 7 are written in the squares of the cross (see picture below) in such a way that the sum of the numbers in the row is equal to the sun of the numbers in the column. Which of the numbers can be written in the center square of the cross?



5, 7

9. John has 10 balls, numbered 0 to 9. He gave four of the balls to George and three to Ann. The each of the three friends multiplied the numbers on their balls. As the result, John got 0, George got 72, and Ann got 90. What is the sum of the numbers on the balls that John kept for himself?

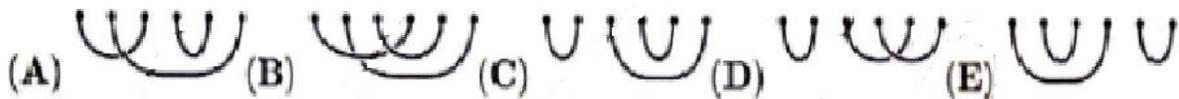
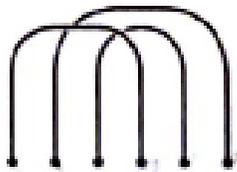
George (4 balls): 1, 3, 4, 6

Ann (3 balls): 2, 5, 9

John (3 balls): 0,7,8

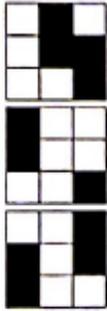
$$0+7+8=15$$

10. Three ropes are laid down on the floor as shown in the picture. You can make one big, complete rope by adding one of the sets of rope ends shown in the pictures below. Which of the sets will make one complete rope?



C

11. We have three transparent sheets with the patterns shown below. We can rotate the three sheets, but not turn them over. Then we put them all one exactly on top of another. What is the maximum possible number of black squares seen in the square obtained in this way if we look at it from above?



8

12. Anna, Betty, Charlie, David, and Elisa were baking cookies on Friday and Saturday. Over the two days, Anna made 24 cookies, Berta 25, Charlie 26, David 27, and Elisa 28. Over the two days, one of them made twice as many cookies as on Friday, one 3 times as many, one 4 times as many, one 5 times as many, and one 6 times as many. Who baked the most cookies on Friday?

(Cookies baked on Friday)

Anna → 6

Betty → 5

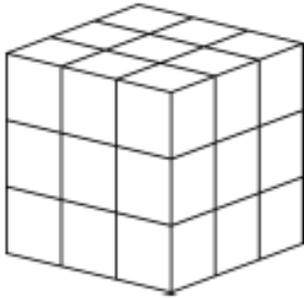
Charlie → 26/6

David → 9

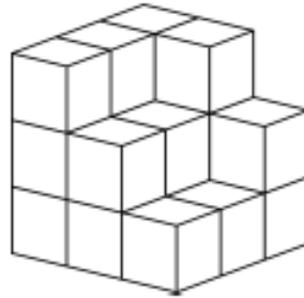
Elisa → 4

David baked the most cookies

13. Nathalie wants to build the same cube as the one Diana built (see picture).



Diana's cube

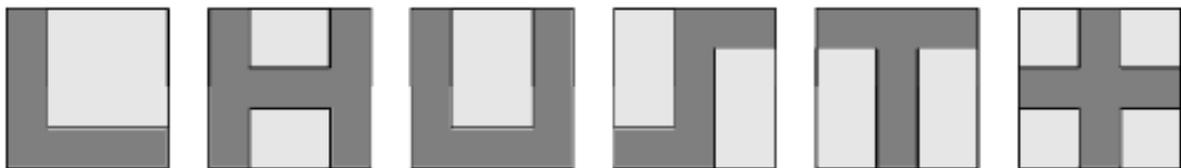


Nathalie's cube

However, Nathalie ran out of small cubes and built only part of the cube, as shown in the picture. How many more small cubes does Nathalie need to complete her cube?

7

14. Jessica shades in various shapes on square sheets of paper (see picture).



How many of these shaded shapes have the same perimeter as the sheet of paper itself?

2

15. A stack of books must be transferred from one bookshelf to another. If Tom does the job alone, it will take two hours. If Bob does the job alone, it will take four hours. How long will it take Tom and Bob to do it together?

$$(1/2) t + (1/4) t = 3/4 t = 1$$

t= 4/3 hours

16. When Pinocchio lies, his nose gets 8 cm longer. When he says the truth, the nose gets 3 cm shorter. When his nose was 7 cm long, he said five sentences. After that, his nose was 25 cm long. How many of Pinocchio's sentences were true?

At 7 cm long, Pinocchio said 3 truths and 2 lies

($-3 \times 3\text{cm} + 2 \times 8\text{cm} = 7\text{cm}$). He said 2 more truths and 3 lies to gain another 18 cm and get to 25 cm ($-2 \times 3\text{cm} + 3 \times 8\text{cm} = 18\text{cm}$).

Total truth sentences = $3 + 2 = 5$ **sentences**

17. There are 2015 inhabitants on an island. Some of them are knights and the others are liars. As you know, the knights always tell the truth and the liars always lie. Every day, one of the inhabitants says: "After my departure the number of knights on the island will equal the number of liars," and then leaves the island. After 2015 days, there is nobody on the island. How many liars were there initially?

- (A) 0 (B) 1007 (C) 1008
(D) 2015 (E) It is impossible to determine.

D

18. A rabbit eats cabbage, carrots, and grass. In any one day, he eats either 9 carrots, or two heads of cabbage, or 1 head of cabbage and four carrots, or only grass. Over the last 10 days, the rabbit ate a total of 30 carrots and 9 heads of cabbage. On how many of those 10 days did he eat only grass?

2 days of 9 carrots
+3 days of 2 cabbages
+3 days of 1 cabbage and 4 carrots
= 30 carrots, 9 cabbages in 8 days
10-8=**2 days**

19. In a trunk there are 5 chests, in each chest there are 3 boxes, and in each box there are 10 gold coins. The trunk, the chests, and the boxes are locked. At least how many locks need to be opened in order to take out 50 coins?

8

20. Mike chose a three-digit number and a two-digit number. The difference of these numbers is 989. What is their sum?

- A) 1001 B) 1010 C) 2005
D) 1000 E) 1009

$$999 - 10 = 989.$$

$$999 + 10 = 1009$$

E