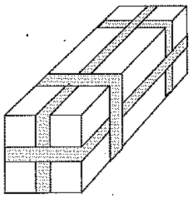
Math Kangroo Practice*

Los Angeles Math Circle

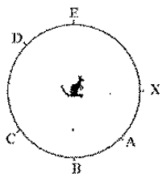
February 5, 2017

1. Ania's birthday present is placed in a box with dimensions 10cm × 10cm × 30cm and wrapped with a ribbon as shown in the picture. What is the length of the ribbon?



2. If you take a square and fold three of its corners behind, how many vertices does the new figure formed have?

3. The kangaroo's nose is pointing towards X (see the picture). Toward which letter will its nose be pointing if it turns in place 270° clockwise?



*Problems taken from Math Kangaroo 2000, Level 5-6

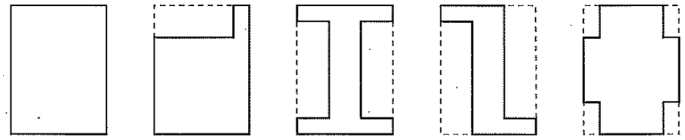
4. A train is 56kmaway from the nearest station and is approaching the station traveling 9kmevery 10 minutes. How far from the station will the train be after 30 minutes?

5. How many twos and fives are there among the prime factors of the number 2000?

6. The number $-11 - 2(-7)$ is equal to what?

7. The sum of five consecutive natural numbers is equal to 2000. What is the largest number of the five?

8. Each of five neighbors owns a rectangular plot of land with the same area. The parts of the land flowers growing on them are fenced in (solid lines in the pictures). Who has the longest fence?



A) Mr. Adam B) Mr. John C) Mr. Jack D) Mr. Peter E) Mr. Mark

9. Number a is greater than number b. The difference between numbers a and b is 15. If we decrease number a by 5 and increase number b by 2, then what will the difference be?

10. Andrew comes to the computer lab every day, Florence every 2 days, Eli every 3 days, Taylor every 4 days, Rong every 5 days, and Karen every 6 days. Today they are all in the computer lab. In how many days will they all be there together again?

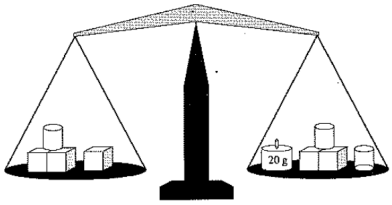
11. Which four digits need to be removed from the number 4921508 to get the smallest possible three-digit number?

12. How many four-digit numbers with a sum of their digits equal to 3 are there?

13. If $A - 1 = B + 2 = C - 3 = D + 4 = E - 5$, then which of the numbers A, B, C, D, and E is the greatest?

14. How long will it take to print out one million forms, if it takes 1 minute to print 100 of these forms?

15. The scale shown in the picture is in balance. On the scales there is a 20g weight and certain solids: cubes and cylinders. All the solids (cubes and cylinders) together weight 500g. How much does one cube weigh?



16. The length of one of the sides of a rectangle was increased by 10%, and the length of the other side of the rectangle was decreased by 10%. How did the area of the rectangle change?

17. The jump of a little kangaroo is 1mlong and takes one-half of a second. His mother's jump is 3mlong and takes one second. The mother and little kangaroo start at the same time from the same place and are jumping towards a eucalyptus which is 180maway. For how many seconds will the mother be waiting for the little kangaroo at the tree?

18. How many different weights can be determined using a balance and one each of 1kg, 3kg, and 9kg weights (we can place the weights on either side)?

19. We used 8 grams of play dough to make a cube with an edge of 2cm. How many grams of play dough do we need to make a cube with an edge of 4cm?

20. The leader of the math camp in Zakopane decided to divide 96 participants into groups. Each group would have the same number of people in it, and there would be at least 5 and at most 20 people in each. How many number of possible groups are there?