

Math Kangaroo 2002

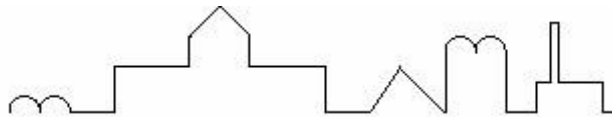
Level of grades 5 - 6

Problems 3 points each

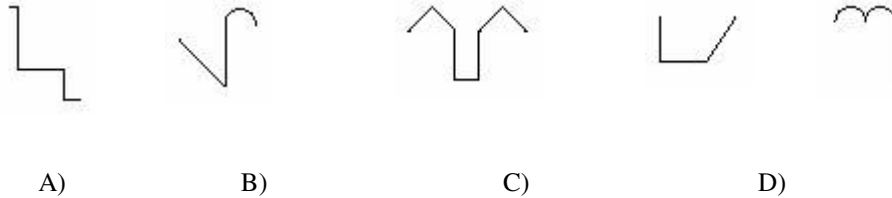
1. The number 2002 read from left to right and from right to left is the same. Which number from the numbers below does not have this property?

A) 1991 B) 2323 C) 2112 D) 2222 E) 4334

2.



The picture below is a sketch of a castle. Which of the lines below does not belong to the sketch?



E)

3. Mr. and Mrs. Kowalski have three daughters. Each of them has two brothers. How many children does the Kowalski family have?

A) 9 B) 7 C) 6 D) 5 D) 11

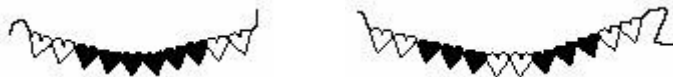
4. In which number below is the square of the tens digit equal to the triple of the sum of the digits of hundreds and ones?

A) 192 B) 741 C) 385 D) 138 E) 231

5. The product $2^2 \cdot 2^{2000} \cdot 2$ is equal to: (\cdot denotes multiplication)

A) 2^{4000} B) 2^{2002} C) 2^{2003} D) 2^{4002} E) 2^{4001}

6.



On which string is the number of black hearts equal to two thirds of the number of all the hearts on that string?



A)

B)

C)

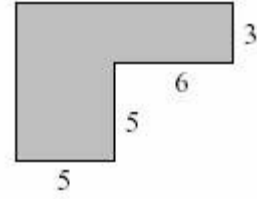


D)

E)

7. Which of the numbers below is the greatest? (\cdot denotes multiplication, $:$ denotes division)

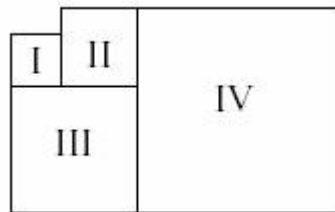
- A) $10 \cdot 0.001 \cdot 100$ B) $0.01 : 100$ C) $100 : 0.01$ D) $10,000 \cdot 100 : 10$ E) $0.1 \cdot 0.01 \cdot 10,000$



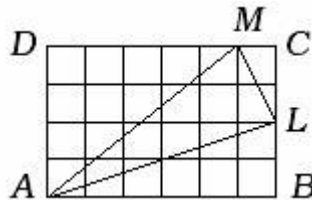
8. The area of the figure in the picture below is equal to:
 A) 43 B) 88 C) 58 D) 30 E) 15
9. The area of a certain rectangle is equal to 1 m^2 . What is the area of a triangle that was cut off from that rectangle along the line connecting the midpoints of the two adjacent sides?
 A) 33 dm^2 B) 25 dm^2 C) 40 dm^2 D) $3,750 \text{ cm}^2$ E) 1,250 cm^2
10. We subtracted the smallest three-digit number with all different digits from the greatest three-digit number with all different digits. The result was:
 A) 864 B) 885 C) 800 D) 899 E) Other number

Problems 4 points each

11. Figures I, II, III and IV are squares. The perimeter of square I is equal to 16 m, and the perimeter of square II is equal to 24 m. The perimeter of square IV is equal to:



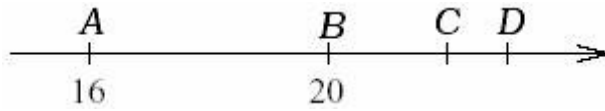
- A) 56 m B) 60 m C) 64 m D) 72 m E) 80 m
12. One medal can be cut out from a golden square plate. If four medals are made from four plates, the remaining parts of those four plates can be used to make one more plate. What is the largest number of medals that could be formed when 64 plates are used?
 A) 85 B) 64 C) 80 D) 84 E) 100



13. Rectangle ABCD (see the picture) is built out of 24 little squares with the length of each side equal to 1. What is the area of triangle ALM?

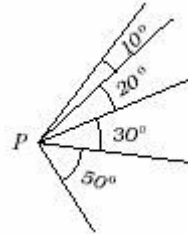
- A) 5 B) 6 C) 7 D) 8 E) Other

14. In the picture below the coordinates of points A and B were indicated. What are the coordinates of points C and D if $\div AB \div = 2 \div BC \div$, $\div BC \div = 2 \div CD \div$?



- A) 24 and 32 B) 24 and 28 C) 24 and 26 D) 22 and 24 E) 22 and 23

15. Mirek has 9 sticks with the lengths of 1 dm, 2 dm, 3 dm, 4 dm, 5 dm, 6 dm, 7 dm, 8 dm, 9 dm. With the sticks he builds triangles of which each side is built with one stick. How many triangles with a side of 1 dm can be built with those sticks?
 A) 6 B) 3 C) 2 D) 1 E) 0



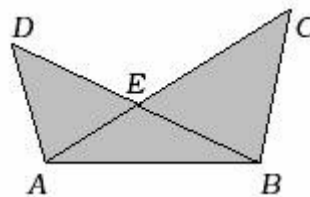
16. How many convex angles with different measures are made by the rays with P as the starting point (see the picture).
 A) 4 B) 6 C) 8 D) 10 E) 11

17. How many different three-digit numbers divisible by 25 can be made with the digits 0, 3, 5, 7 if the digits can be repeated?
 A) 16 B) 9 C) 81 D) 64 E) 3

18. Each boy: Mietek, Mirek, Pawel, and Zbyszek has exactly one of the following animals: a cat, a dog, a gold fish, and a canary-bird. Mirek has a pet with fur. Zbyszek has a pet with four legs. Pawel has a bird, and Mietek and Mirek don't like cats. Which of the following sentences is not true?

- A/ Zbyszek has a dog. B/ Pawel has a canary. C/ Mietek has a golden fish.
 D/ Zbyszek has a cat. E/ Mirek has a dog.

19. The next day after his birthday Jas said: "The day after tomorrow will be Thursday." On what day of the week did Jas have his birthday?
 A) On Monday B) On Tuesday C) On Wednesday D) On Thursday E) On Friday

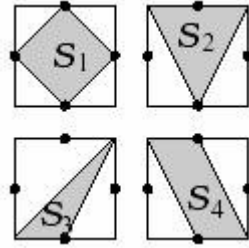


20. In the picture below, the area of triangle ABD is equal to 15, the area of triangle ABC is equal to 12 and the area of triangle ABE is equal to 4. What is the area of pentagon ABCED?
 A) 19 B) 31 C) 23 D) 27 E) 35

Problems 5 points each

21. The weight of each possible pair of boys from a group of 5 was recorded. The following results were obtained: 90 kg, 92 kg, 93 kg, 94 kg, 95 kg, 96 kg, 97 kg, 98 kg, 100 kg and 101 kg. The total weight of all five boys equals:
 A) 225 kg B) 230 kg C) 239 kg D) 240 kg E) 250 kg

22. There are four congruent squares. In each of them the midpoints of the sides are indicated and some regions with areas S_1, S_2, S_3 and S_4 are shaded. Which expression below is true?



- A) $S_3 < S_4 < S_1 = S_2$
 B) $S_3 < S_1 = S_2 = S_4$
 C) $S_3 < S_1 = S_4 < S_2$
 D) $S_3 < S_4 < S_1 < S_2$
 E) $S_4 < S_3 < S_1 < S_2$

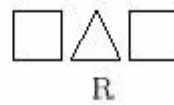
23. You count from 1 to 100 and you clap when you say the multiples of number 3 and the numbers that are not multiples of 3 but have 3 as the last digit. How many times will you clap your hands?

- A) 30
 B) 33
 C) 36
 D) 39
 E) 43

24. The cyclist went up the hill with the speed of 12 km/h and went down the hill with the speed of 20 km/h. The ride up the hill took him 16 minutes longer than the ride down the hill. How many minutes did the cyclist take to go down the hill?

- A) 24
 B) 40
 C) 32
 D) 16
 E) 28

25.



Symbols P, Q, R, S indicate the total weight of the figures drawn above them. It is known that any two figures of the same shape have the same weight. If $P < Q < R$, then:

- A) $P < S < Q$
 B) $Q < S < R$
 C) $S < P$
 D) $R < S$
 E) $R = S$

26. Ada has 14 gray balls, 8 white balls and 6 black balls in a bag. What is the least number of the balls she has to take out of her bag having her eyes closed to make sure that she took at least one ball of each color?

- A) 23
 B) 22
 C) 21
 D) 15
 E) 9

27. A computer virus destroys computer memory. On the first day it destroyed $\frac{1}{2}$ of this memory. On the second day it destroyed $\frac{1}{3}$ of the memory remaining after the first day; on the third day it destroyed $\frac{1}{4}$ of the memory remaining after two days and on the fourth day it destroyed $\frac{1}{5}$ of the memory remaining after three days. What part of all the computer memory was left after those four days?

- A) $\frac{1}{5}$
 B) $\frac{1}{6}$
 C) $\frac{1}{10}$
 D) $\frac{1}{12}$

E) $\frac{1}{24}$

28. What is the greatest value of the sum of the digits of the number made from the sum of the digits of a three-digit number?

A) 9
12

B) 10
E) 18

C) 11

D)

29. In the chess competition 32 players were competing. The competition was taking place by steps. In each step all the players were divided into groups of four. In each of these groups every player played once with every other player. The two best players from the group went to the next level and the two worst players were out of the competition. After the step in which four last players played, the two best players were playing an additional final game. How many games were played during the whole competition?

A) 49

B) 89

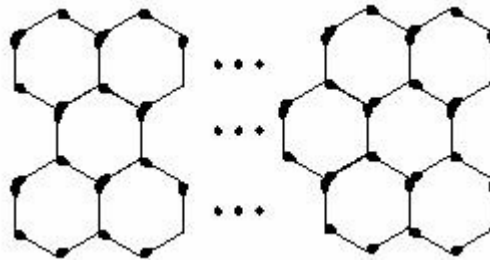
C) 91

D)

97

E) 181

30.



A net with 32 hexagonal spaces in three rows was made out of matches (see the picture.) How many matches were used to make this net?

A) 123

B) 124

C) 125

D) 120

E) 121

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