The Mathematics Kangaroo 2004
Cadets (grades 7 or 8)
18.3.2004

- 3-point questions-
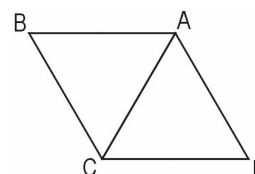
1) How much is 2004 – 4 x 200?

A) 400800   B) 400000   C) 2804   D) 1204   E) 1200

2) 360 000 seconds are equal to

A) 3 hours B) 6 hours C) 8,5 hours D) 10 hours E) more than 10 hours

3) ACD is an equilateral triangle. By what angle do you need to rotate the triangle counterclockwise with center of rotation A, until one side of the rotated triangle coincides with a side of the triangle in the original position?
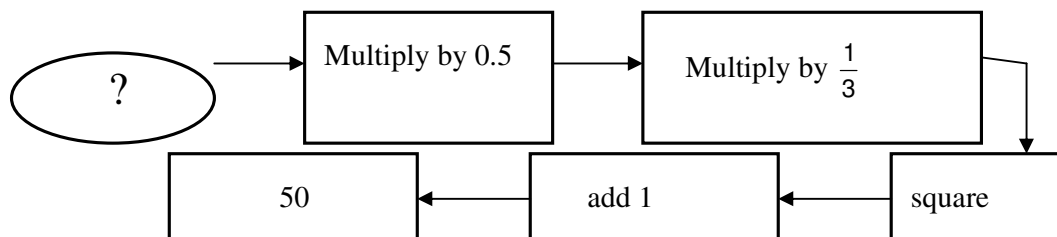

A) 60°   B) 120°   C) 180°   D) 240°   E) 300°

4) Which number is not a divisor of 2004?

A) 3   B) 4   C) 6   D) 8   E) 12

5) Which number (?) is the starting number?

A) 18   B) 24   C) 30   D) 40   E) 42

6) Igor has 16 playing cards: 4 of each suit spade(♠), clubs (♣), diamonds(♦) and hearts (♥). He wants to put one card from each suit into each row or column in the square on the right. You can see how Igor has started. How many cards from different suits can be used in the square with the question mark?

A) none   B) 1   C) 2   D) 3   E) 4

7) The term $(1-2)-(3-4)-(5-6)-...-(99-100)$ is equal to
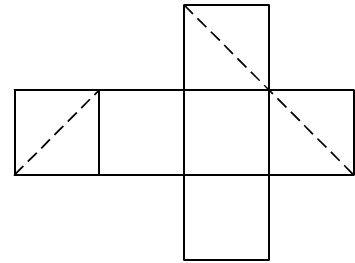
A) 0   B) 49   C) -48 D) 48   E) 50

8) Nine bus stops are in equal intervals along a bus route. The first stop is 600 m from the third.. What is the distance between the first and the last stop
A) 1200 m B) 1500 m C) 1800 m D) 2400 m E) 2700 m

9) The intersection of a cube and a plane is indicated on the net of the cube with a dotted line. The section has the shape of a...?

A) equilateral triangle   B) rectangle but not a square
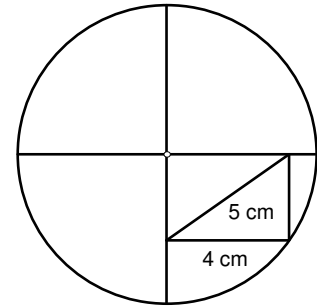C) square   D) right triangle   E) hexagon

10) Our neighbor has a rectangular vegetable garden. He wants to increase both length and width by 10%. By how many percent would the area of the vegetable garden increase?

A) 10%   B) 20%   C) 21%   D) 40%   E) 121%

- **4-point questions-**

11) How large is the diameter of the circle?

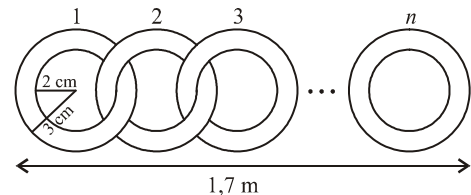A) 10 cm   B) 12 cm   C) 12,5 cm   D) 14 cm   E) 18 cm

12) An ice cream stand offers nine different flavors of ice cream. In a group of children each child buys a cone with 2 scoops of different flavor. No 2 children take the same combination and all possible combinations of flavors are bought. How many children are in that group?

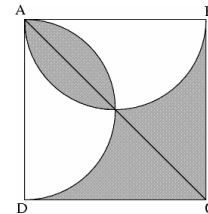A) 9   B) 36   C) 72   D) 81   E) 90

13) Rings are connected to form a chain as indicated on the right. The length of the chain is 1,7 m. How many rings were used for that chain?

A) 30   B) 21   C) 42   D) 85   E) 17

14) On the right you see the square ABCD und the semicircles with diameter AB or AD. If AB = 2, then the shaded area is equal to

A) 2   B) 1   C) 2π D) $\frac{\pi}{2}$ E) $\frac{3}{4}$

15) There are 11 squares in a row. The first square contains the number 7 , the ninth square the number 6. The sum of any 3 consecutive numbers must be 21. Which number will be in the second square?

A) 7   B) 8   C) 6   D) 10   E) 21

16) Each symbol represents exactly one numeral. Which numeral is represented by the square?

A) 9   B) 8   C) 7   D) 6   E) 5

17) In the first of 2 consecutive years there were more Tuesdays than Thursdays. Neither of the 2 years was a leap year. What day was most frequent in the second year?

A) Tuesday   B) Wednesday   C) Friday   D) Saturday   E) Sunday

18) The best math student of the 1b form is supposed to find a natural number. Her friends tell her the following:
Thomas: "The number is 9."
Roman: "The number is a prime number."
Andrea: "The number is even."
Michaela: "The number is 15."
Thomas or Roman said the truth exactly once, and Andrea or Michaela likewise. What is the number?

A) 1   B) 2   C) 3   D) 9   E) 15

19) ABC is an isosceles triangle with AB = AC = 5 cm und ∠ BAC > 60°. The perimeter is a natural number. How many such triangles are possible?

A) 1   B) 2   C) 3   D) 4   E) 5

20) Alfonso the ostrich practices for the head-into-the-sand competition in the Animolympics. When he took his head out of the sand on Monday at 8:15 hours, he achieved a new record time of 98 hours and 56 minutes. At what time did Alfonso stick his head into the sand?
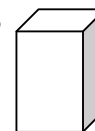
A) Thursday at 5:19   B) Thursday at 5:41   C) Thursday at 11:11
D) Friday at 5:19   E) Friday at 11:11

- 5 –point questions-

21) You have many building blocks 1 cm long, 2 cm wide and 3 cm high.
How many blocks are necessary to build a cube with no empty space inside?

A) 12   B) 18   C) 24   D) 36   E) 60

22) Each of five mathematicians thinks of either the number 1, 2 or 4. They multiply the 5 numbers with each other. What is a possible product?

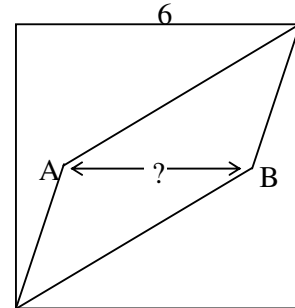A) 100   B) 120   C) 256   D) 768   E) 2048

23) The average age of Granny, Grandpa and their 7 grandchildren is 28. The average age of the 7 grandchildren is 15. How old is Grandpa, if he is 3 years older than Granny?

A) 71   B) 72   C) 73   D) 74   E) 75

24) In an animal resort were kangaroos. One says „there are six of us in here", and jumps over the fence. Every following minute one kangaroo says „each one that has jumped before me lied", and jumped over the fence. This goes on until there are no more kangaroos in the resort. How many kangaroos spoke the truth?

A) 0   B) 1   C) 2   D) 3   E) 4

25) The sides of the square on the right are 6 cm long. A and B are points on the horizontal axis of symmetry. A and B are connected with the vertices as shown. If the square is divided into 3 figures of equal area, then the measure of the line segment AB is

A) 3,6 cm   B) 3,8 cm   C) 4,0 cm   D) 4,2 cm   E) 4,4 cm

26) Mrs. Pritti drives from her house to the beach with an average speed of 30 km/h. She is tired on her way back and drives an average speed of 10 km/h. What was her average speed for both ways?

A) 12 km/h   B) 15 km/h   C) 20 km/h   D) 22 km/h   E) 25 km/h

27) Hans puts books onto his book shelf. Each of the books has either 48 or 52 leafs. Which of the following numbers can not be the number of leafs in all the books on his shelf?

A) 500   B) 524   C) 568   D) 588   E) 620

28) Given two natural numbers, a and b, which are not divisible by 10. If ab is equal to 10000, then a + b is equal to

A) 641   B) 1000   C) 1024   D) 1258   E) 2401

29) The number 2004 is divisible by 12, and the sum of its digits is 6. How many 4- digit numbers have the same properties?

A) 10   B) 12   C) 13   D) 15   E) 18

30) The triangle in the diagram to the right is equilateral. By what number do you have to multiply the area of the small circle to get the area of the large circle?

A) 12   B) 16   C) $9\sqrt{3}$ D) π^2 E) 10