Exercises Kangaroo Friday March 17th 2000
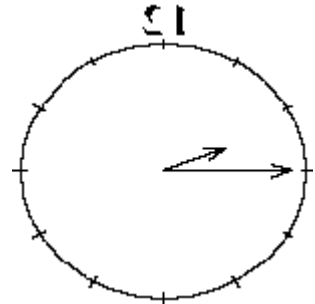
First and second year

Questions 1 to 10: *+3 points for each correct answer, -¾ points for each incorrect answer*

1. In the mirror we see a clock. What time does it show in reality?

A) 9.45 B) 10.15 C) 10.45 D) 14.15 E) 15.15

2. In a black and white photo 80% is black, 20% is white. It is enlarged by a factor 3. What is the percentage of white in the enlargement?

A) 20% B) 30% C) 40% D) 60% E) 80%

3. What is the maximum number of grey figures (as shown) that can be placed on the white square? The grey figures may be rotated, but they may not overlap, and the small squares must fit exactly.

A) 2 B) 3 C) 4 D) 5 E) 6
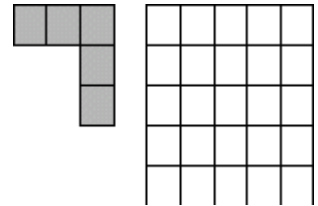
4. In a fast food shop two hamburgers and one coke together cost 3.50 euro.

Two cokes and one hamburger together cost 4 euro.

What is the total price of one coke and one hamburger?

A) 1,50 B) 1,75 C) 2 D) 2,25 E) 2,50

5. Seven consecutive odd numbers add up to 119. What is the smallest of these numbers?

A) 11 B) 13 C) 15 D) 17 E) 19

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6. The March Hare always lies on Monday, Tuesday and Wednesday, and always speaks the truth on the other days of the week. The Hatter lies from Thursday through Saturday, and speaks the truth on the other days. On a certain day both tell Alice:

"Yesterday was one of those days that I always lie•. What day was "yesterday•?

A) Monday B) Wednesday C) Thursday D) Friday E) Sunday

7. On a strip of paper with length 1 metre and width 5 centimetre, we draw lines across, dividing it into four equal parts of width 5 cm. On the same strip we put lines across to divide it onto three equal parts, again of width 5 cm. Then we cut the strip at each of the lines.

How many different lengths do the resulting pieces have?

A) 2 B) 3 C) 4 D) 5 E) 6

8. In the shown figure (not drawn to scale!) we have AB=AC and AD=CD and •ABC=75° and •ADC=50°. How large is •BAD ?

A) 30° B) 85° C) 95° D) 125° E) 140°
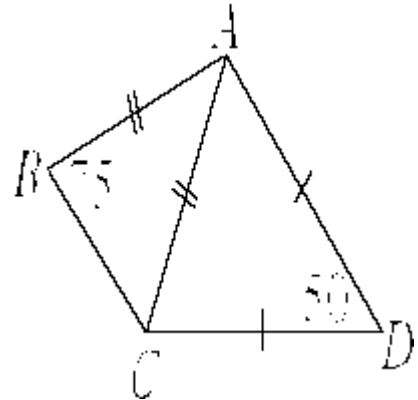
9. Chantal has a great number of rectangular blocks of size 1×2×6 cm. She wants to use them to build a solid cube. What is the smallest number of blocks she needs to do so?

A) 6 B) 12 C) 18 D) 36 E) 144

10. Marc has been given a box with 2000 sweets in five different colors. 384 sweets are white, 396 yellow, 402 red, 408 green and 410 brown. Without looking, he takes three sweets from the box. If all three have the same color, he eats them at once, otherwise he puts them back in the box. Continuing this way for the entire day, in the evening he ends up with only two sweets in the box, both of the same color. Which color?

A) white B) yellow C) red D) green E) brown

Questions 11 to 20: +4 points for each correct answer, -1 point for each incorrect answer

11. What is the area of the grey part of the shown figure?

A) 6 B) 9 C) 12 D) 15 E) 18
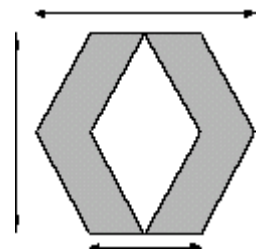
12. Each letter represents a digit. Different letters represent different digits. Then we have ...

KANGOEROE + 100000 × OEROE - 100000 × KANG =

A) OEROEKANG B) KANGKANG C) KANGOEROE

D) GOEKANROE E) OEROEOEROE

13. Five Dutch girls, An, Bea, Carla, Dini and Els, shake hands: An shakes hands with exactly one

other girl, and so does Bea. Carla, Dini and Els each shake hands with two other girls. We happened to see An and Els shaking hands. Of which of the following pairs can we be sure that they did *not* shake hands?

A) Dini and Els B) Carla and Els C) Bea and Carla D) Bea and Els E) Bea and Dini

14. From a round cake we cut a piece of 15% of the whole cake, as shown. What is the central angle of this piece?

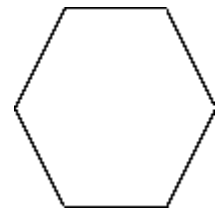A) 15° B) 36° C) 45° D) 54° E) 60°
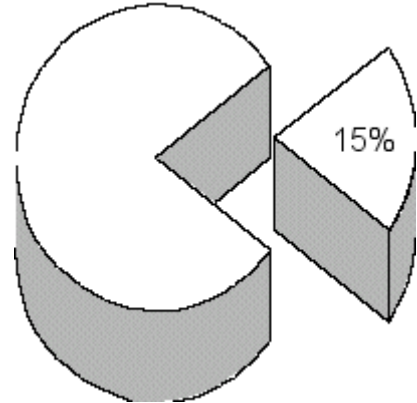
15. 800 thalers represents the same value as 100 ducats, and 100 thalers amount to the same as 250 pennies. How many ducats are equivalent to 100 pennies?

A) 2 B) 5 C) 10 D) 25 E) 50

16. We connect every pair of vertices of a regular hexagon by straight lines. How many intersection points result (not counting the vertices of the hexagon)?

A) 6 B) 7 C) 12 D) 13 E) 15

17. Mother bought a rectangular box with rectangular sugar lumps. Marga ate the upper layer, containing 77 lumps. Then she ate all lumps of the rightmost layer, 55 in total. To finish her meal, she ate all lumps in the front layer. How many lumps did she leave in the box?

A) 256 B) 295 C) 300 D) 350 E) 385

18. During a dance contest each competitor gets a whole number of points from each member of the jury. Rianne earned an average of 5.625 points. What is the minimum number of members of the jury?

A) 2 B) 6 C) 8 D) 10 E) 12

19. In the National Park of Australia, where the kangaroos live, the climate is such that

(1) If the sun shines, the temperature is not below 25 degrees centigrade.

(2) If the temperature is above 26 degrees centigrade, then the sun shines.

From these facts, we know for sure that A) at night the temperature is below 25 degrees

B) during daytime, temperature is above 24 degrees

C) if the temperature is 25 degrees, then the sun shines

D) during daytime, temperature cannot be 24 degrees

E) at nigth, temperature cannot be 27 degrees

20. The cube maps below consist of white and grey regions. We fold each map to a cube. For which one of the resulting cubes is it true that at each edge regions of the same color meet?
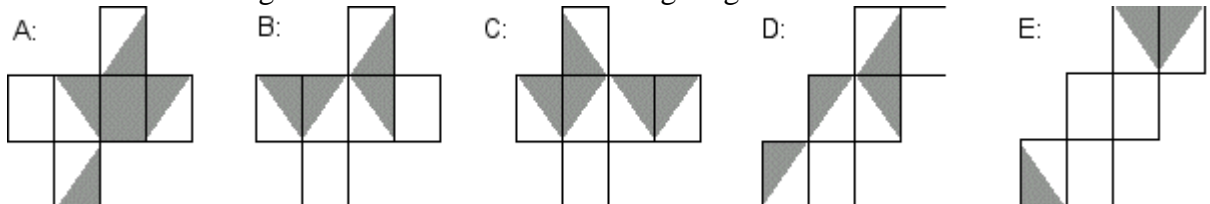
Questions 21 to 30: +5 points for each correct answer, **-1¼** point for each incorrect answer

21. The most experienced animal attendant needs 40 minutes to wash an elephant. His son needs 2 hours to do the same job.

How long does it take them, working together, to wash three elephants?

A) 30 min. B) 45 min. C) 60 min. D) 90 min. E) 100 min.

22. In three years time, Stephen will be three times as old as three years ago. In four years time, Stephen will be . . . . times as old as four years ago. What word has to be filled in?

A) two B) three C) four D) five E) six

23. The right-angled triangle ABC is divided into eight strips of the same width by seven segments parallel to BC. If BC=10, then the total length of these seven segments is:
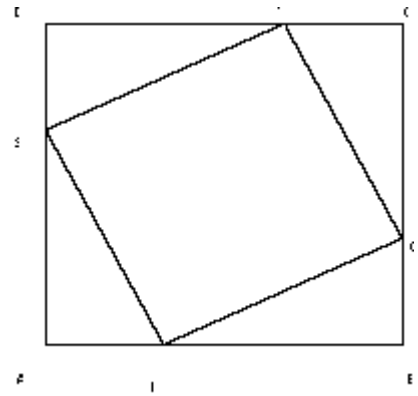
A) 35 B) 45 C) 50 D) 70

E) that cannot be decided
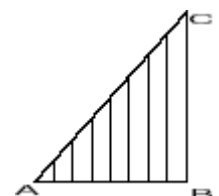
24. Points P, Q, R and S divide the sides of rectangle ABCD in the ratio 1:2, as shown in the figure. If ABCD has area 1, then the area of PQRS equals:

A) 2/5 B) 3/5 C) 4/9 D) 5/9 E) 2/3

25. Marlies had a set of 6 sticks. By arranging them into three pairs, she could put them on the table in the form of an equilateral triangle (a triangle with three equal sides). On a certain day, one stick was missing, so Marlies decided to make one new stick to form an equilateral triangle again. She measured the remaining pieces and found that they were 25, 29, 33, 37 and 41 cm long. How many possibilities does she have for the length of her new stick?

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

26. We write in ascending order all positive integers that are equal to the product of their proper divisors (1 and the number itself are not proper divisors). The first number in this sequence therefore is 6, since 6 = 2×3. What is the sixth number in the sequence?

A) 14 B) 15 C) 21 D) 22 E) 25

27. In the accompanying figure you see a lattice of 9 points. Using these lattice points, you can make many different triangles that are *not* right-angled. They have many different forms. How many?
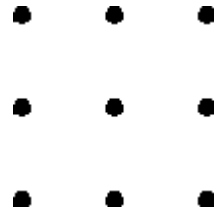
A) 3 B) 4 C) 5 D) 8 E) 12

28. Every time a wish is fulfilled, the longer side of a magical rectangle loses half of its length, and its shorter side loses a third of its length. After three wishes, its area is only 4 cm².

Originally, its shorter side was 9 cm.

What was the length of its longer side?

A) 4 cm B) 12 cm C) 18 cm D) 24 cm E) 36 cm

29. In the figure you see 9 ***distinct*** domino pieces neatly arranged, with matching faces having an equal number of dots. The cloth prevents us from seeing the dots on the covered pieces. What is the number of dots on the central, hatched colored square?
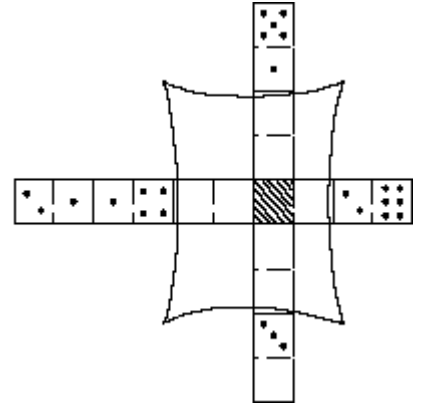
A) 0 B) 1 C) 2 D) 3 E) 4

30. You have nine coins in your pocket. If you take out six coins at random, you will always have at least one • gulden' (*f* 1,00) and two • kwartjes' (*f* 0,25). What is the total value of the nine coins?

A) *f* 3,00 B) *f* 4,50 C) *f* 5,25 D) *f* 7,50 E) this cannot be decided