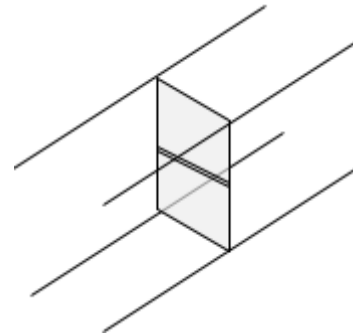
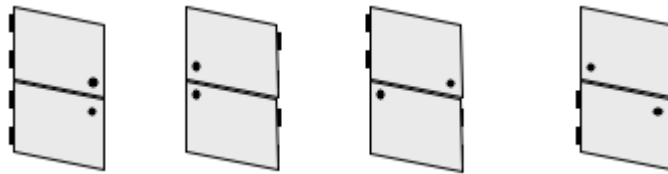


” ” ” ” ”  
 ” ; ”  
 A) 2 B) 4 C) 6 D) 8 E) 10

$8^8$   $4^4$ ;  
 A) 2 B) 3 C) 4 D) 8 E) 16



;



- A)
- B)
- C)
- D)
- E)

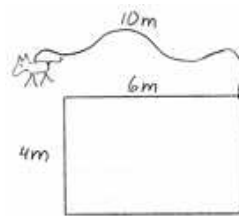
”Kangourou”

;

- A)
- B)
- C)
- D)
- E)

10m

6 m × 4 m.



A)  $20\pi$

B)  $22\pi$

C)  $40\pi$

D)  $88\pi$

E)  $100\pi$

21 : 00

100 km/h

80 km

100 km

;

A) 22 : 12

B) 22 : 15

C) 22 : 20

D) 22 : 25

E) 22 : 30

10cm

;

A) 10 cm

B) 30 cm

C) 40 cm

D) 60 cm

E)

KANGAROOKANGAROO...KANGAROO  
KANGAROO

20

;

A) K

B) A

C) N

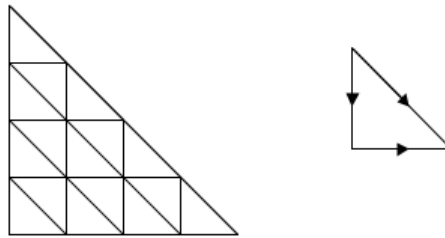
D) G

E) O

;

- A) 10      B) 20      C) 30      D) 40      E) 50

;



- A) 16      B) 27      C) 64      D) 90      E) 111

*Joe*

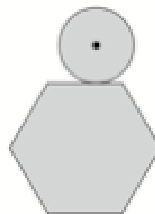
*Joe*

;

- A) 0      B) 2006      C) 2007      D) 2008      E) 2009

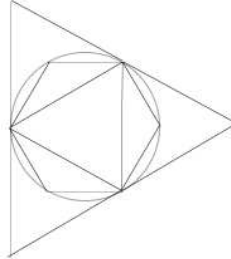
1 cm  
1 cm

;



- A)  $6 + \frac{\pi}{2}$       B)  $6 + \pi$       C)  $12 + \pi$       D)  $6 + 2\pi$       E)  $12 + 2\pi$

$S_2$  ;  $S_3$   $S_1$



A)  $S_3 = \sqrt{S_1 \times S_2}$       B)  $S_3 = \frac{S_1 + S_2}{2}$       C)  $S_1 = S_2 + S_3$

D)  $S_3 = \sqrt{S_1^2 \times S_2^2}$       E)  $S_1 = S_3 + 3S_2$

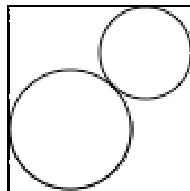
$A$        $6 \cdot A$        $10 \cdot A$        $A$ ;

A) 30      B) 40      C) 54      D) 72      E) 96

;

A) 16      B) 17      C) 19      D) 25      E)

$1 \text{ cm}$        $\text{cm}$  ;



A)  $\frac{1}{2}$       B)  $\frac{1}{\sqrt{2}}$       C)  $\sqrt{2} - 1$       D)  $2 - \sqrt{2}$       E)

;

- A)
- B)
- C)
- D)
- E)

;

- A) 5      B) 10      C) 44      D) 50      E) 120

$$x^2 - 3x + 1 = 0 \quad a \quad b \quad a^3 + b^3$$

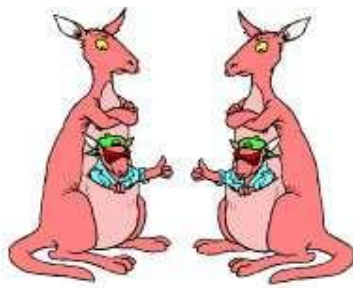
- A) 12      B) 14      C) 16      D) 18      E) 24

$$6 \text{ cm} \quad \text{cm}^3$$

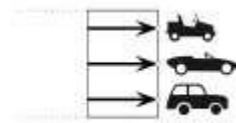
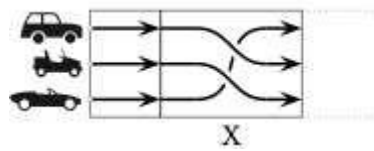
;

- A) 18      B) 36      C) 48      D) 72      E) 144





Mike



Mike

A) B) C) D) E)

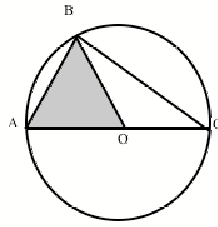
*Anh*      *Anh*      30      *Ben*      5      *Chen*      *Chen*      4

*Anh;*

A) 8      B) 9      C) 11      D) 12      E) 13

$\sqrt{3}$

ABC



A)  $2\sqrt{3}$

B) 2

C) 5

D) 4

E)  $4\sqrt{3}$

$$\frac{\eta\mu 1^0}{\sigma\nu 89^0}$$

A) 0

B)  $\epsilon\varphi 1^0$

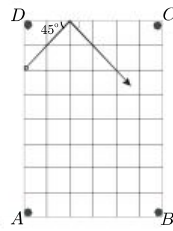
C)  $\sigma\varphi 1^0$

D)  $\frac{1}{89}$

E) 1

$45^\circ$

;



A) A

B) B

C) C

D) D

E)

X

3 m

12 m

2

X;



A) 3

B) 4

C) 5

D) 6

E)

80%

Peter

15

5

10

80%

;

A) 20

B) 25

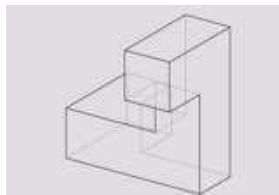
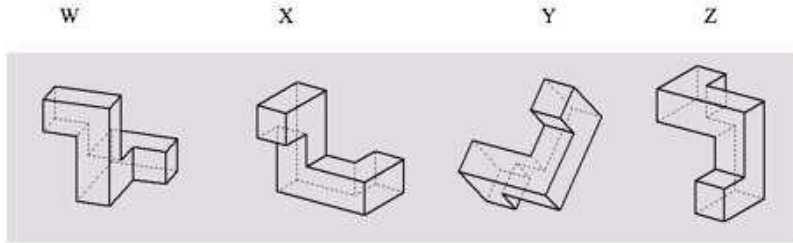
C) 30

D) 35

E) 40



;

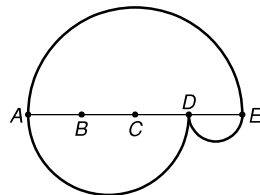


- A) W Y    B) X Z    C) Y D)    E) W, X Y

AE

AE AD DE

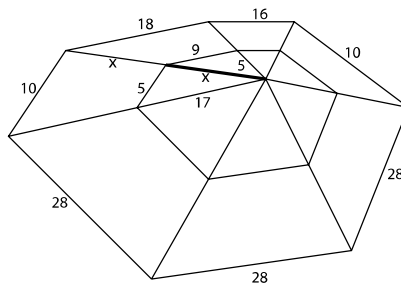
A E



- A) 1 : 2    B) 2 : 3    C) 2 : 1    D) 3 : 2    E) 1 : 1

$x$

$x$



- A)    B)    C)    D)    E)

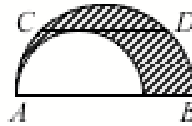
- $ABCD$                        $\frac{1}{ABCD}$
- A) 5                      B) 6                      C) 7                      D) 8                      E) 9

- $\beta$                       25%                       $\gamma$                       50%                       $\alpha$
- $\gamma$
- A) 25%                       $\alpha$
- B) 50%                       $\alpha$
- C) 75%                       $\alpha$
- D) 100%                       $\alpha$
- E) 125%                       $\alpha$

- $2^{x+1} + 2^x = 3^{y+2} - 3^y$                        $x$                        $y$                        $x$
- A)                      B)                      C) -1                      D)                      E)

- $\sigma\nu\nu 1^0 + \sigma\nu\nu 2^0 + \sigma\nu\nu 3^0 + \dots + \sigma\nu\nu 358^0 + \sigma\nu\nu 359^0 ;$
- A) 1                      B)  $\pi$                       C) 0                      D) 10                      E) -1

- $AB$                        $CD$                       4



- A)  $\pi$                       B)  $1,5\pi$                       C)  $2\pi$                       D)  $3\pi$                       E)

- A) 4                      B) 8                      C) 9                      D) 11                      E)

Thomas

;

- A) 4                      B) 5                      C) 6                      D) 7                      E) 8

A

B

A    B

;

- A) A  
 B)  
 C)  
 D) A  
 E) B

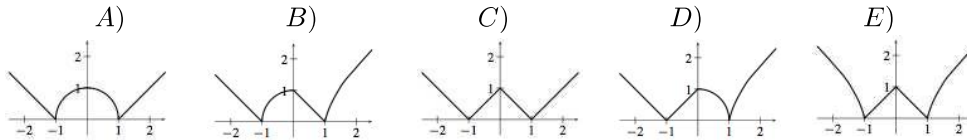
B

3

;

- A) 30                      B) 24                      C) 12                      D) 6                      E) 3

$$\sqrt{|(1+x)(1-|x|)|}$$



$x + \sqrt{x}$                        $x$

;

- A) 870                      B) 110                      C) 90                      D) 60                      E) 30

$f(x) = \frac{2x}{3x+4}$      $f(g(x)) = x$      $g(x) =$

- A)  $g(x) = \frac{3x+4}{2x}$     B)  $g(x) = \frac{3x}{2x+4}$     C)  $g(x) = \frac{2x+4}{4x}$     D)  $g(x) = \frac{4x}{2-3x}$     E)

Ann Belinda Charles  
 4 5 Charles  
 Belinda Charles Ann  
 Charles

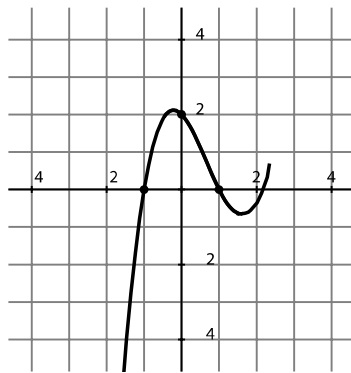
Ann  
 1 2 3 Belinda  
 Ann

A)  $\frac{1}{6}$     B)  $\frac{1}{8}$     C)  $\frac{1}{11}$     D)  $\frac{1}{13}$     E) Charles

;

A)  $15^0$     B)  $30^0$     C)  $45^0$     D)  $60^0$     E)  $75^0$

$f(x) = ax^3 + bx^2 + cx + d$     b;



A) -4    B) -2    C)    D)    E)

$x^2 + ax + 2007 = 0$     a

A) 3    B) 4    C) 6    D) 8    E)

$$\frac{1}{2\sqrt{1} + 1\sqrt{2}} + \frac{1}{3\sqrt{2} + 2\sqrt{3}} + \dots + \frac{1}{100\sqrt{99} + 99\sqrt{100}}$$

A)  $\frac{999}{1000}$     B)  $\frac{99}{100}$     C)  $\frac{9}{10}$     D) 9    E) 1

;

- A) 5                      B) 10                      C) 44                      D) 50                      E) 120

123451234512345...

100

;

	1	2	3	.	.	.
	5	2	3	4	5	.
	4	1	1	2	1	
	3	5	4	3	2	
	2	1	5	4	3	

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

1, 3, 4, 9, 10, 12, 13, ...

3  
3

100

;

- A) 150                      B) 981                      C) 1234                      D) 2401                      E)  $3^{100}$



## Kangourou Mathematics 2008 Levels 3-4

**3 Points**

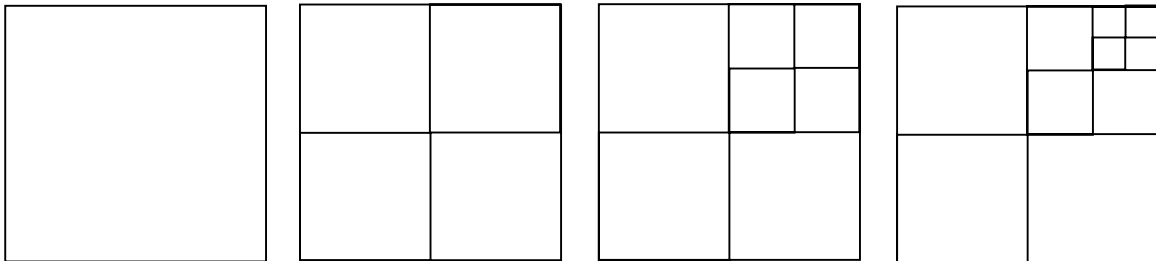
1) We eat 3 meals a day. How many meals to we eat in a week ?

- A) 7                      B) 18                      C) 21                      D) 28                      E) 37

2) An adult ticket to the ZOO costs 4 euros, the ticket for a child is 1 euro cheaper. How many euros must a father pay to enter the ZOO with his two children?

- A) 5                      B) 6                      C) 7                      D) 10                      E) 12

3) We make a sequence of figures with tiles. The first four figures have 1, 4, 7 and 10 tiles, respectively.



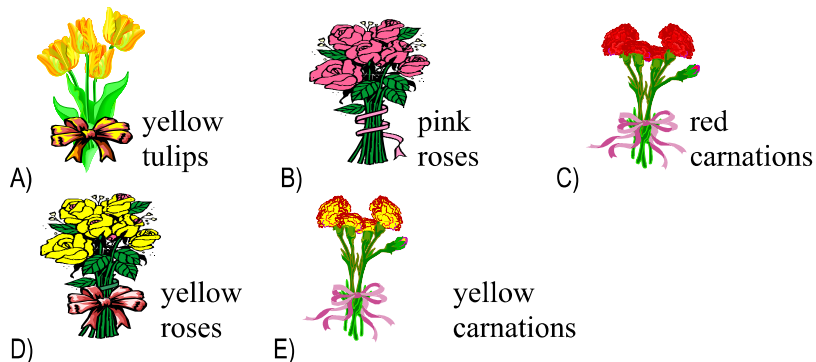
How many tiles will the fifth figure have?

- A) 11                      B) 12                      C) 13                      D) 14                      E) 15

4)

Miriam gave her mother, grandmother, aunt and two sisters each a bunch of flowers. Which of them was for her mother, if you know that

- the flowers for sisters and aunt were of the same colour,
- grandmother did not receive roses.



5)

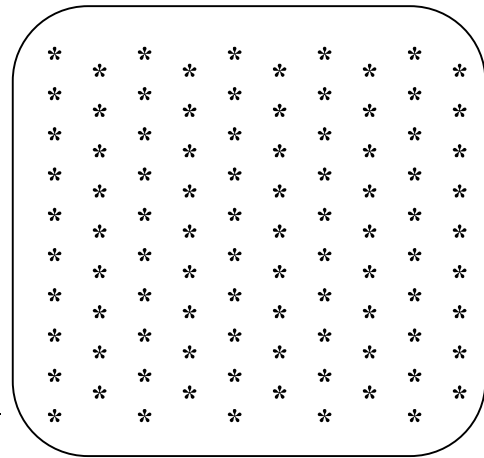
Theresa has 37 CDs. Her friend Claudia said: "If you give me 10 of your CDs, we will both have the same number of CDs." How many CDs does Claudia have?

- A) 10                      B) 17                      C) 22                      D) 27                      E) 32

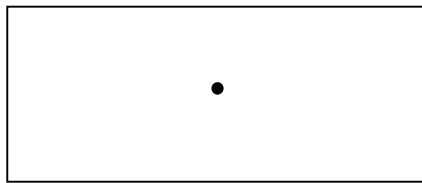
## Kangourou Mathematics 2008 Levels 3-4

6) How many stars are inside the figure?

- A) 100                      B) 90                      C) 95  
 D) 85                      E) 105



7) Rebecca has drawn a point on a piece of paper. She now draws four straight lines that pass through this point. Into how many sections do these lines divide the paper?



- A) 4                      B) 6                      C) 5                      D) 8                      E) 12

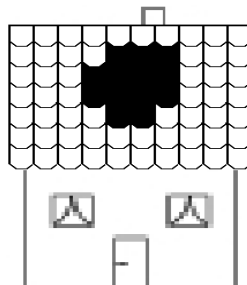
8) In six and one half hours it will be four hours after midnight. What time is it now?

- A) 21:30                      B) 04:00                      C) 20:00                      D) 02:30                      E) 10:30

**4 points**

9)

The storm made a hole in the front side of the roof. There were 10 roof tiles in each of 7 rows. How many tiles are left on the front side of the roof?



- A) 57                      B) 59                      C) 61                      D) 67                      E) 70





## Kangourou Mathematics 2008 Levels 3-4

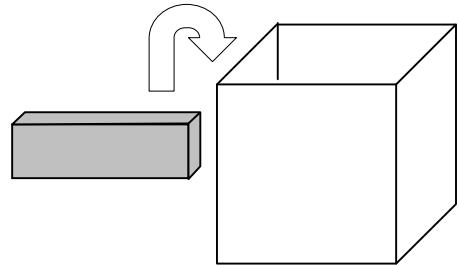
16) There are three songs on a CD. The first song is 6 minutes and 25 seconds long, the second song is 12 minutes and 25 seconds long, and the third song is 10 minutes and 13 seconds long. How long are all the three songs together?

- A) 28 minutes 30 seconds                      B) 29 minutes 3 seconds  
 C) 30 minutes 10 seconds                    D) 31 minutes 13 seconds  
 E) 31 minutes 23 seconds

**5 points**

17) We have a large number of blocks of  $1 \times 2 \times 4$  cm. We will try to put as many of these blocks as possible in a box of  $4 \times 4 \times 4$  cm so that we can close the box with a lid. How many blocks fit in?

- A) 6                      B) 7                      C) 8  
 D) 9                    E) 10



18)

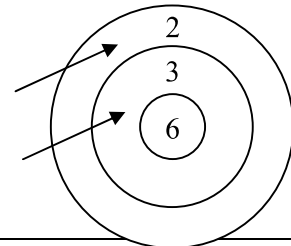
A kangaroo noticed that each winter he puts on 5 kilos and each summer he loses only 4. His weight is steady in spring and autumn. In the spring of 2008, he weighs 100 kg. How much did he weigh in autumn of the year 2004?

- A) 92 kg                      B) 93 kg                      C) 94 kg                      D) 96 kg                      E) 98 kg

19)

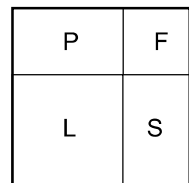
Jane shoots two arrows at the target. In the drawing we see that her score is 5. If both arrows hit the target, how many different scores can she obtain?

- A) 4                      B) 6                      C) 8  
 D) 9                    E) 10



20) A garden in the shape of a square is divided into a pool (P) a flowerbed (F) a lawn (L) and a sandpit (S) (see the picture). The lawn and the flowerbed are in the shape of a square. The perimeter of the lawn is 20 m, the perimeter of the flowerbed is 12 m. What is the perimeter of the pool?

- A) 10 m    B) 12 m    C) 14 m                      D) 16 m    E) 18 m



21) Bill has as many brothers as sisters. His sister Ann has twice as many brothers as she has sisters. How many children are there in this family?

- A) 3                      B) 4                      C) 5                      D) 6                      E) 7

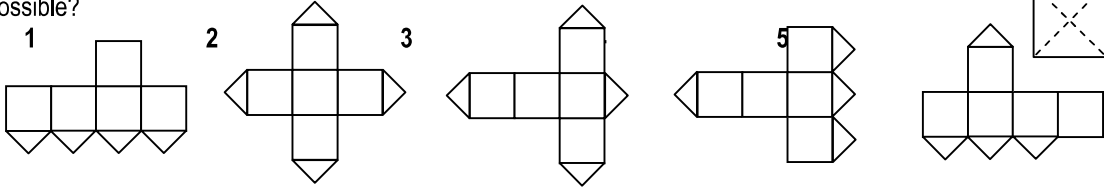
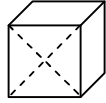
22) How many two-digit numbers are there in which the digit on the right is larger than the digit on the left?

- A) 26                      B) 18                      C) 9                      D) 30                      E) 36

## Kangourou Mathematics 2008 Levels 3-4

23)

One of the cube faces is cut along its diagonals (see the fig.). Which of the following nets are impossible?



A) 1 and 3

B) 1 and 5

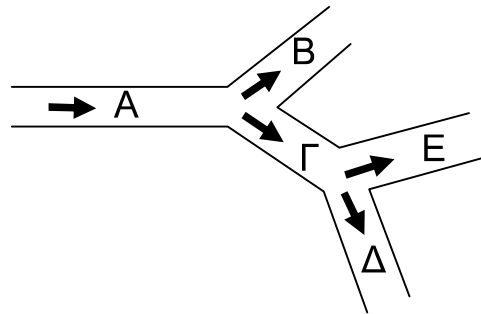
C) 3 and 4

D) 3 and 5

E) 2 and 4

24)

30 men and 40 women entered the road A. 20 of the men turned left into the road B and the rest turned into the road  $\Gamma$ . From the women group, 15 turned right into the road  $\Gamma$  and the rest turned left into the road B. From the women that entered the road  $\Gamma$ , 7 turned into the road  $\Delta$  and the rest into the road E. From the men who entered the  $\Gamma$ , 8 turned into the road  $\Delta$  and the rest into the road E. How many people in total entered the road E?

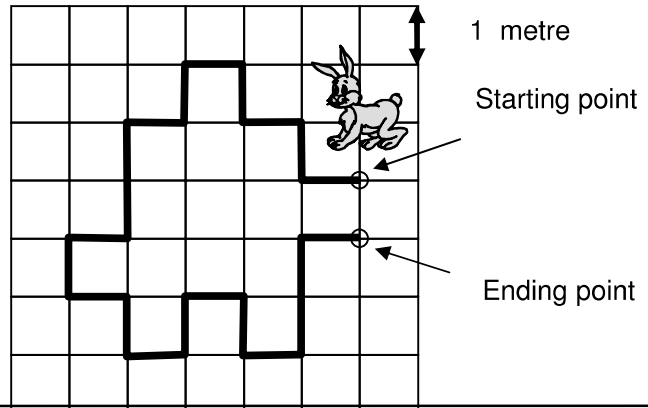


A) 8    B) 10    C) 12    D) 14    E) we cannot find it

3 points questions:

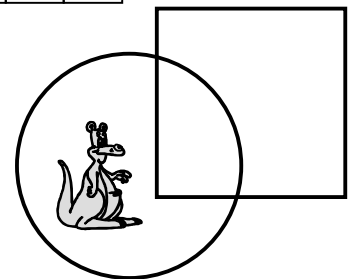
1) A garden is designed with square tiles of side 1 metre. A rapid walked the path shown in the figure. How many metres did the rapid walked?

- A) 18 metres
- B) 19metres
- C) 20 metres
- D) 21 metres
- E) 22 metres

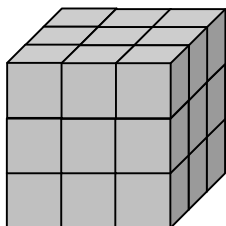


2) Where is the Kangourou?

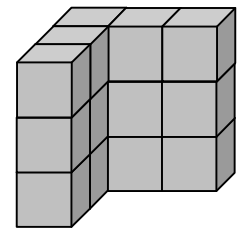
- A) Inside the circle, but outside the square.
- B) Inside the circle and inside the square.
- C) Inside the square, but outside the circle.
- D) Outside the square and outside the circle.
- E) Neither inside the square nor inside the circle.



3) Christina constructed using small cubes a big cube which had nine cubes as shown in the figure at the left. She then removed some small cubes leaving the figure shown at the right. How many small cubes did she remove?

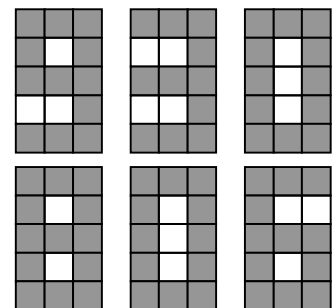


- A) 6
- B) 8
- C) 10
- D) 12
- E) 14



4) John designed the number 930 as shown in the figure. Then he changed colours in some squares of 930 in order to design the number 806. In how many squares, in total, he changed the colour?

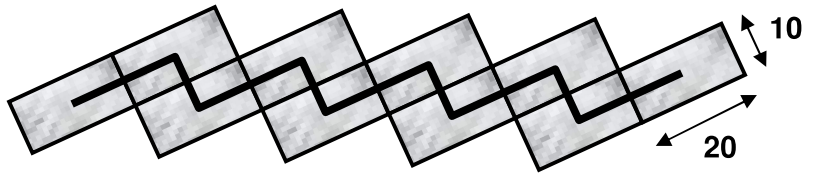
- A) 5
- B) 6
- C) 7
- D) 8
- E) 9



5) On the table there are 16 cherries. Anna ate half of them, Baso ate two and Yiota the rest. How many cherries did Yiota eat?

- A) 4
- B) 6
- C) 8
- D) 10
- E) 12

6) The garden is constructed with 10 plates of dimension 10 cm by 20 cm. Nicos has designed a line that passes through the centre of each tile, as shown in the figure. What is the length of the line designed by Nicos?



- A) 70 cm      B) 90 cm  
C) 140 cm    D) 150 cm      E) 180 cm

7) Maria threw three dice and added the numbers shown. If the sum she obtained was 17, how many of the three dice were showing the number 6?

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

8) A movie in a cinema was 90 minutes long. It started showing at 9:10 in the morning (at 9 o'clock and 10 minutes in the morning). During the show there was a break of 8 minutes and one commercial break of 5 minutes. What time did the movie show finish?

- A) at 10 o'clock and 13 minutes      B) at 10 o'clock and 27 minutes  
C) at 10 o'clock and 47 minutes      D) at 10 o'clock and 53 minutes  
E) at 11 o'clock and 13 minutes

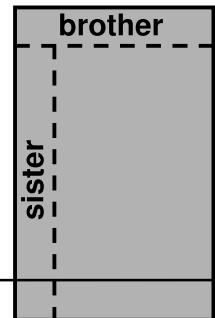
4 points questions:

9) On a tree there are 25 green birds and 19 yellow. Every one hours 2 more green and 3 more yellow birds are coming to the tree. In how many hours the green birds will be as many as the yellow birds on the tree?

- A) in 6 hours      B) in 5 hours      C) in 4 hours      D) in 3 hours      E) in 2 hours

10) Peter was dividing a chocolate. He broke one row of 5 pieces for his brother and then one row of 7 pieces for his sister in a way you see on the picture. How many pieces did the whole chocolate consist of?

- (A) 28      (B) 32      (C) 35      (D) 40      (E) 54



11) A Kangourou and a Bear weight together 300 kg. The Bear weighs 40 kg more than the Kangourou. What is the weight of the Kangourou?

- A) 32 kg      B) 110 kg      C) 130 kg      D) 150 kg      E) 260 kg

12) A kid wrote on the board the numbers 20, 21, 22, 23, 24 and 25. The teacher asked him to add all these numbers. However, the kid made a mistake and forgot to add one of these numbers. If the answer he found was 112, which number did he forgot?

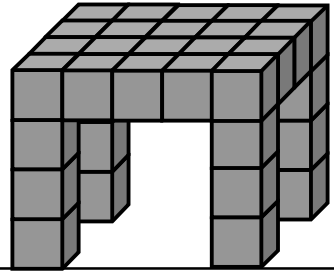
- A) 21      B) 22      C) 23      D) 24      E) 25

13) Takis has two gardens. The one has a rectangular shape with one side 8 m and the other half of the first. The second garden has a square shape. What is the side length of the square if the two gardens have the same perimeter?

- (A) 4 m      (B) 6 m      (C) 8 m      (D) 12 m      (E) 24 m

14) Thomas made a table from small cubes (see the picture). How many cubes did he use?

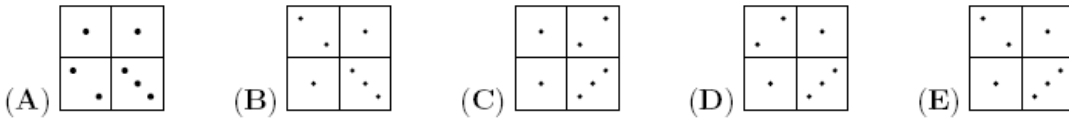
- (A) 24      (B) 26      (C) 28      (D) 32      (E) 36



15) Three squirrels Anni, Asia and Elli collected 7 nuts. They all collected different number of nuts, but each of them found at least one. Anni collected the least, Asia the most of all. How many nuts did Elli find?

- (A) 1      (B) 2      (C) 3      (D) 4      (E) impossible to determine

16) Which figure can we not make with the dominos

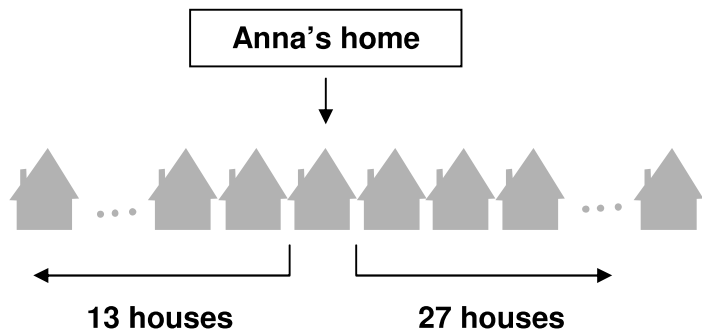


5 points questions:

17) In a park there are 10 cats and some pigeons. There are no other animals in the park. If the number of legs of the pigeons is the same with the number of legs of the cats, how many are all the animals, cats and pigeons?

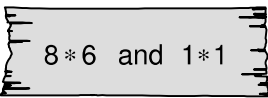
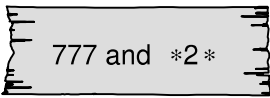
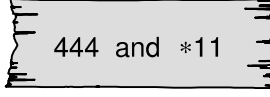
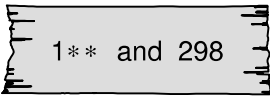
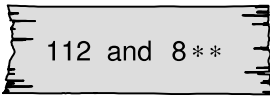
- (A) 20      (B) 30      (C) 40      (D) 50      (E) 60

18) Ann and Peter live in the same street, with houses in one series, one next to another. On one side of Ann's house the street has 27 houses and on the other side 13 houses. Peter lives in middle house of the street. How many houses are there between Ann's house and Peter's house (without counting the houses of Ann and Peter)?



- (A) 6      (B) 7      (C) 8  
(D) 14      (E) 21

19) George had a piece of paper on which there were two three digit numbers, but some digits were erased. He remembered that the sum of the digits of one of the numbers was the same with the sum of the digits of the other. Which of the papers below is the one containing the numbers of George?

- A)  B)  C) 
- D)  E) 

20) Maria plants each some trees. Each year the trees she plants are equal to the number of the trees she planted in the previous two years. In 2008 she planted 60 trees and in 2009 she planted 96 trees. How many trees did she plant in 2006?

- A) 20      B) 24      C) 36      D) 40      E) 48

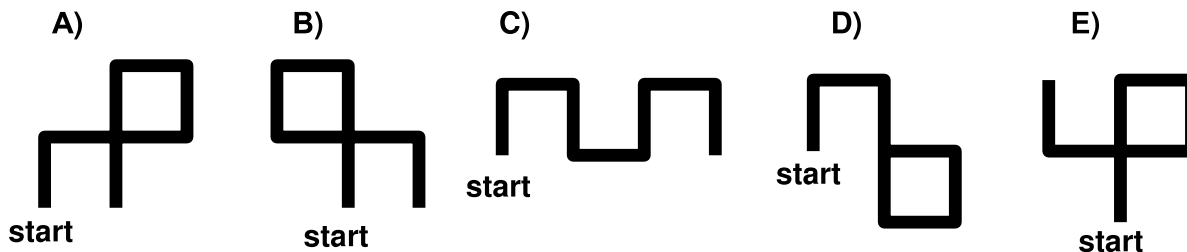
21) Niki wrote on the board the numbers 1, 2, 8 and 9. Using two of the four numbers she wrote a two digit number and with the remaining two a second two digit number. She then added the two two-digit numbers. What is the largest possible sum that she can get?

- A) 187      B) 198      C) 119      D) 173  
E) none of the above

22) A boat started its trip on Saturday afternoon and arrived to its destination the next day at 7 in the afternoon. At 6 in the morning of Sunday it was in the middle of its trip. What time did it start the trip?

- A) at 5 in the afternoon      B) at 6 in the afternoon      C) at 7 in the afternoon  
D) at 8 in the afternoon      E) it is not possible to find it

23) Ntina walked a path of length 7 km following straight path lines of 1 km each. At the end of each straight path she was either turning left or right in order to follow a new 1 km straight path. At each turn she draws either a symbol # or a symbol &. She was always using the same symbol for left or right turn, but we do not know which symbol she was using for left or right turns. At the end she noted that her path was #&&&##. Which of the following shows her total path, if she started from the point showing "start"?



24) Three friends, Anna, Vaso and Yianna went to the library of the school in order to borrow some books. All together borrowed 15 books. After a few days Anna returned to the library 1 book, Vaso returned 2 books and Yianna returned 3 books. After the returns, the three friends has the same number of books from the library. How many books did Yianna borrowed at the beginning?

- A) 3      B) 4      C) 5      D) 6      E) 7

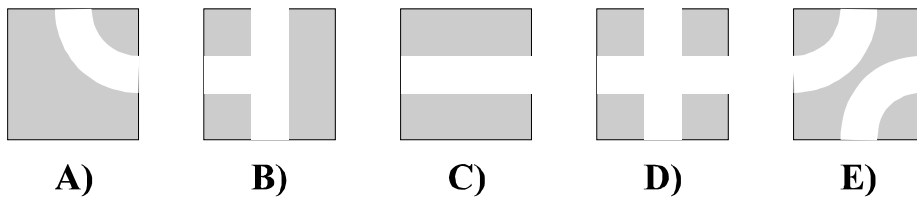
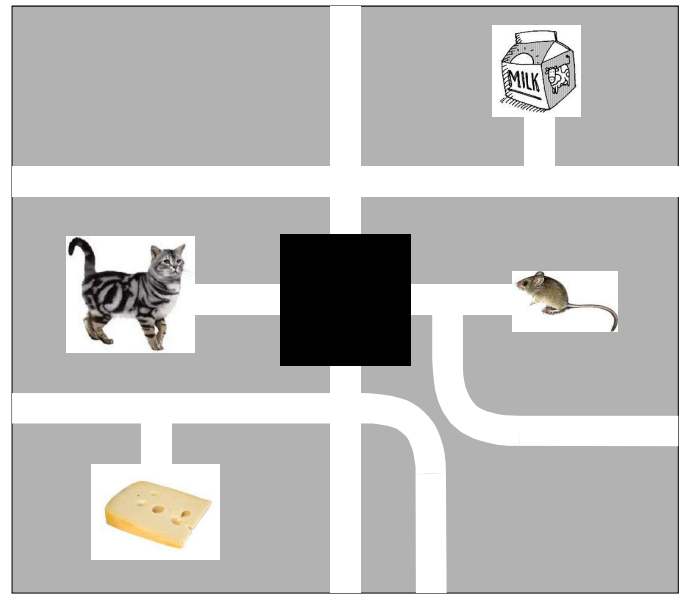
# **MATHEMATICS**

**LEVEL: 3 – 4**  
**(Γ' - Δ' Δημοτικού)**

10:00 – 11:00 , 20 March 2010

**3 points**

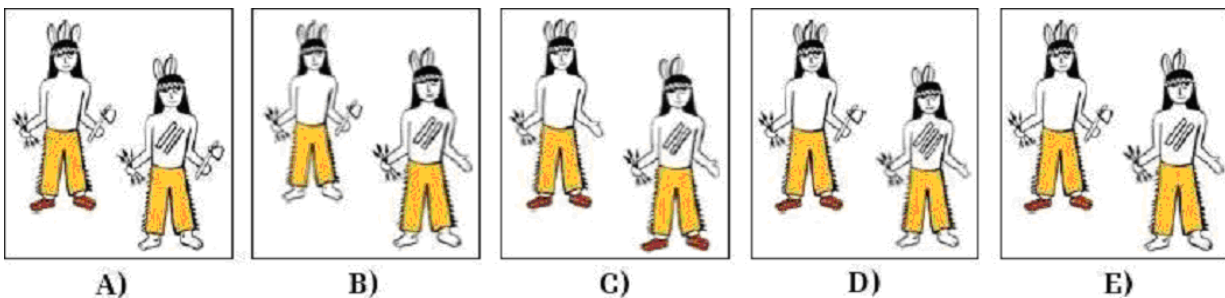
1. There is a hidden part of the path in the picture for a cat and a mouse. The cat can reach the milk, mouse can reach the cheese, but cat and mouse can never meet. How should the hidden part look like?



2. A 40 minutes lesson started at 11:50. Exactly at the middle of the lesson, a bird flew into the classroom suddenly. When did that happen?

- A) 11:30
- B) 12:00
- C) 12:10
- D) 12:20
- E) 12:30

3. Indian chief Big Bear has three feathers, tomahawk, arrows and moccasins on feet. His son White Cheetah has two feathers, arrows, doesn't have tomahawk, he is barefooted and has two stripes drawn on his chest. Which picture shows the chief Big Bear together with White Cheetah?

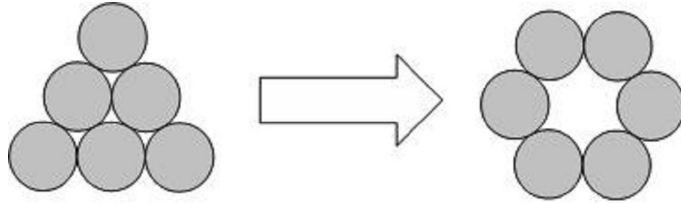




4. In a restaurant, first course costs 4€, main course 9€ and dessert 5€. The Menu, which is first course + main course + dessert, costs 15€. How much does someone save if he orders the Menu instead of the three separate courses?

- A) 3€      B) 4€      C) 5€      D) 6€      E) 7€

5. Six coins together from a triangle as shown. You have to move some coins in order to form a circle as you can see in the second picture. What is the minimum number of coins that have to be moved?




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

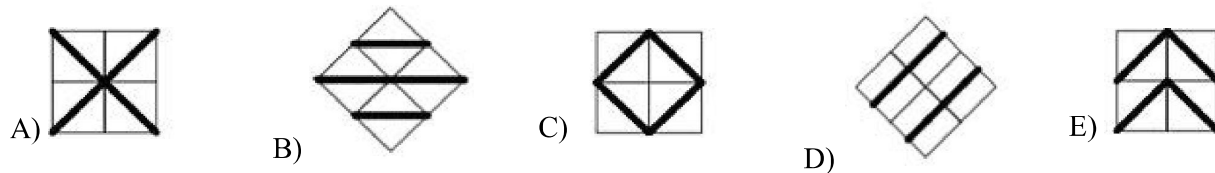
6. Four friends were eating ice-cream:

- Markos ate more than Fanis,
- John ate more than Vasilis,
- John ate less than Fanis.

Which list is the correct starting from one who ate the most to the one who ate the least?

- A) Markos, John, Vasilis, Fanis      B) Vasilis, Markos, Fanis, John  
 C) Markos, Fanis, John, Vasilis      D) John, Vaslis, Markos, Fanis  
 E) John, Markos, Vasilis, Fanis

7. Using only tiles like this , which of the following mosaics would be impossible to construct?

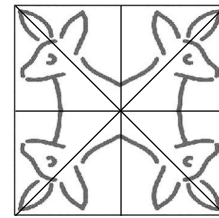


8. Centipede Eve has 100 feet. Yesterday, she bought and put on 16 pairs of new shoes. In spite of that, 14 of her feet are still bare. On how many feet did she have shoes before the shopping?

- A) 27      B) 40      C) 54      D) 70      E) 77

**4 points**

9. Mary folded and unfolded a paper four times as indicated by drawings. How many times did it happen that the Kangourous coincide when the paper was folded?

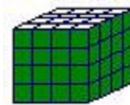


- A) 0      B) 1      C) 2      D) 4      E) infinitely many.

10. Mathew and Clara are living in a skyscraper. Clara is living 12 floors above Mathew. One day Mathew went by stairs to visit Clara. On the half of his way he was on the 8th floor. On which floor does Clara live?

- A) 12      B) 14      C) 16      D) 20      E) 24

11) A larger cube is made out of 64 little white wooden equal-sized cubes. 5 sides of the larger cube are coloured green. How many cubes have 3 green sides?

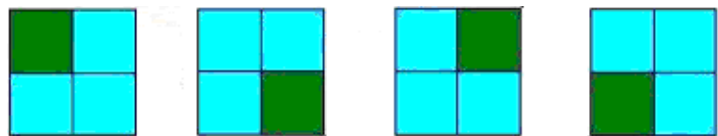


- A) 4      B) 8      C) 16      D) 20      E) 24

12. A ferry can take either 10 small cars or 6 lorries through the river at one time. On Wednesday, it crossed the river five times, it was full and transported 42 vehicles. How many small cars did the ferry transport?

- A) 10      B) 12      C) 20      D) 22      E) 30

13. A square is divided into 4 smaller equal-sized squares. All the smaller squares are coloured green or blue. For example, all four colourings shown have the same colouring. How many different colourings are possible?



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

14. John starts a chainletter. He sends a letter to his mate Peter. Peter has to send the letter to 2 other people. Everyone who receives this letter, has to send it also to 2 other people. After 2 rounds in total  $1 + 2 + 4 = 7$  persons have received the letter. How many persons in total have received this letter after 4 rounds?

- A) 15      B) 16      C) 31      D) 33      E) 63

15. Children were measuring the length of a sand playground by steps. Ana made 15 equal steps, Betty 17, Denis 12 and Ivo 14. Whose steps were the longest ones?

- A) Ana      B) Betty      C) Denis      D) Ivo      E) Impossible to determine.

16. If both rows have the same sum, what is the value of \*?

1	2	3	4	5	6	7	8	9	10	199
11	12	13	14	15	16	17	18	19	20	*

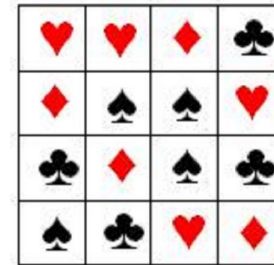
- A) 99                      B) 100                      C) 209                      D) 289                      E) 299

**5 points**

17. The product  $60 \cdot 60 \cdot 24 \cdot 7$  equals:

- A) the number of minutes in seven weeks                      B) the number of hours in sixty days  
 C) the number of seconds in seven hours                      D) the number of seconds in one week  
 E) the number of minutes in twenty-four weeks

18. Every cell of the  $4 \times 4$  table contains a playing card (their suits are shown in the picture). One lead allows switching the positions of any two cards. At least how many leads will be played so that each row and each column will contain all suits?



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

19. Two years ago, the sum of the ages of two cats Tony and Tiny was 15 years. Now Tony is 13 years old. In how many years will Tiny reach the age of 9 years?

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