22METS **CLASA a IV-a** 5 MARTIE 2010

Here are some suggestions to help you do your best:

- Read carefully each question and think about the answer before choosing your response.

PART I.

1. The difference between the smallest number of three different digits and the largest number of two digits is:

   A 2 **B** 3 **C** 99 **D** 4

2. The number of students who parcipate to our contest "22 METS" is two hundred and forty five. What is another way to write the same number?

   A 245
   B 2045
   C 254
   D 425

3. Anna is getting ready for a big vocabulary test.She learns 9 new words each day.How many days will it take Anna to learn all 72 words on her test?

   A 81 **B** 8 **C** 9 **D** 63

4. Mike had 96 cents in his pocket.He spent 47 cents at the candy store. Later, he bought a pen for 34 cents. How much money has Mike left?

   A 62 cents **B** 5 cents **C** 15 cents **D** 22 cents

PART II.

A student fills in a mathematics piece of paper which has 2010 squares as follows: one square with capital letter "A" , two squares with capital letter "B" , three squares with capital letter "C" , four squares with capital letter "D", five squares with capital letter "E", and six squares with capital letter "F" . Then, the student does the same thing until he completes all the squares.

a)How many times did he repeat the procedure to complete the whole piece of paper?

b)Which letter was written in the last square?

c)How many squares were filled with capital letter "C"?

PART III.

Un tată spune fiului său de 12 ani: " Când tu vei avea vârsta mea de astăzi, eu voi avea 62 ani. " Câți ani are tatăl?

Here are some suggestions to help you do your best:

- Read carefully each question and think about the answer before choosing your response.

PART I.

1. Which expression is equivalent to $3^{10}\cdot 9^2$?

   A 3^{14} **B** 27^{12} **C** 3^{12} **D** 9^5

2. The sum of two numbers is 75 and their difference is 7.What is the larger number?

   A 34 **B** 41 **C** 75 **D** 7

3. The set { 10,11,12} is equivalent to?

   A {x | 10<x<12, where x is an integer} **B** {x | 10≤x<12, where x is an integer}

   C {x | 10≤x≤12, where x is an integer} **D** {x | 10<x≤12, where x is an integer}

4. Express in simplest form: $\frac{4}{3}+\frac{1}{6}-\frac{1}{2}$?

   A 2 **B** 1 **C** $\frac{5}{6}$ **D** 0

PART II.

For the Olympic Games a sportsman trains himself climbing up the steps of a stadium as follows: he climbs up 4 steps, climbs down 2 and climbs up 3 steps and does it again and again.

a) How many steps has the flight of stairs got if the sportsman makes 564 footsteps, while training, to reach the top of it. (a footstep means climbing up or down one step)

b) How many footsteps does the sportsman make, while training, to climb up 164 steps?

(***)

PART III.

Arătați că suma numerelor naturale care împărțite la 2004 dau restul de două ori mai mare decât câtul, se pot scrie ca produsul a trei numere naturale consecutive. (G.M. 10/2009)

CLASA a VI-a 5 MARTIE 2010

Here are some suggestions to help you do your best:

- Read carefully each question and think about the answer before choosing your response.

PART I.

1. A bag contains ten green marbles, eight white marbles and five red marbles.What is the probability of drawing a red marble from the bag?

   A $\frac{10}{23}$ **B** $\frac{8}{23}$ **C** $\frac{5}{23}$ **D** 1

2. Which set of numbers represents the lengths of the sides of a triangle?

   A {5,17,24} **B** {16,24,6} **C** {6,17,21} **D** {25,8,12}

3. Ana solved the equation 5(x+1)-2=33 as follows:

   line 1 5(x+1)-2=33
   line 2 5(x+1)=35
   line 3 5x+1=35
   line 4 5x=34
   line 5 x=6,8

   She made an error between lines:

   A 1 and 2 **B** 2 and 3 **C** 3 and 4 **D** 4 and 5

4. The supplement of a 84^0 angle measures :

   A 6^0 **B** 180^0 **C** 90^0 **D** 96^0

PART II.

At the Mathematics Contest there are 10 winners which get different sums of money .
Each of the first eight gets as much as the next two altogether. How much money was necessary if the first one gets 280 lei ? GM 7-8/2008

PART III.

Fie $n \in N$ și punctele coliniare A, B, C,D (considerate în această ordine) astfel încât: $AB + 2^n \cdot BC + 3^n \cdot CD = 2^n \cdot 3^{n-1} \cdot AD$

Determinați punctul $M \in [BC]$ cu proprietatea că: $AM \cdot MC = BM \cdot MD$

Here are some suggestions to help you do your best:

- Read carefully each question and think about the answer before choosing your response.

PART I.

1. In trapezoid ABCD , AB $\|$ CD , E is the midpoint of [AD] and F is midpoint of [BC].If AB=24 and CD=18 what is the length of [EF]?

   A 12 **B** 9 **C** 22 **D** 21

2. Express in simplest form: $\sqrt{\frac{1}{4}+\frac{1}{3}+\frac{1}{9}}$

   A $\frac{25}{36}$ **B** $\frac{5}{6}$ **C** $\frac{1}{4}$ **D** $\frac{3}{4}$

3. In the triangle ABC, Anna found centroid G by constructing the three medians. If M is the midpoint of side BC she measured AM and found it to be 12 m.If GM=x, Which equation can be used to find x?

   A x+x=12 **B** 3x+2x=12 **C** x+2x=6 **D** x+2x=12

4. In triangle ABC , point D is on [AB], and point E is on [BC] so that DE$\|$AC.If DB=2, DA=5 and DE=4, what is the length of AC:

   A 10 **B** 14 **C** 8 **D** 7

PART II.

In the rectangular trapezoid ABCD with AB $\|$ CD and m ($\sphericalangle$ADC)=90 , the lengths of the sides [AB], [AD], [DC] are proportional to the numbers 1,2 and 3.
Knowing that the area of the triangle $\triangle$MBC is 16 cm^2 where M is the middle of [AD]:
a) Calculate the lengths of the sides [AB];[AD];[DC]
b) Calculate the measure of the angle $\sphericalangle$DCB. (G.M. 11/2009)

PART III. a) Rezolvați ecuația:
$5 + 5\cdot6 + 5\cdot 6^2 + 5\cdot 6^3 + \ldots + 5\cdot 6^{2008} = x^{2009} - 1$

b) Arătați că $\frac{6^{2009}-6}{35} \in N$ (G.M. 6/2009)

Here are some suggestions to help you do your best:

- Read carefully each question and think about the answer before choosing your response.

PART I.

1. In three-dimensional space, two planes are parallel and a third plan intersects both of the parallel planes. The intersection of the planes is a :
   A a plane **B** a point **C** a pair of intersecting lines **D** a pair of parallel lines
2. Which value of x makes the expression $\frac{4x-5}{x-2}$ undefined?
   A x=2 **B** x=1,25 **C** x= -2 **D** x=0
3. Line **d** is perpendicular to plan α at point **A**. Which statement is true?
   A All planes that intersect plan α will pass through A.
   B Only one line in plan α will intersect line d.
   C Any plane containing line d is perpendicular to plan α.
   D Any point in plan α also will be on line d.
4. What is the intersection of the intervals [-2;5) and (-4;2]?
   A [-2;5) **B** (-4;2] **C** (-2;2) **D** [-2;2]

PART II.

In a regular triangular pyramid VABC the side of the base AB=a, we consider M to be the middle of the edge [CV] and the measure of the angle $\measuredangle$MBC is 30^0 . What is the distance from A to BM line ? (GM 3/2009)

PART III.

1. Arătați că dacă *a* şi $n \in N$ atunci $\sqrt{a \cdot (a+n) \cdot (a+2n) \cdot (a+3n) + n^4}$ este număr natural.
2. ABCDA'B'C'D' este o prismă patrulateră regulată cu latura bazei AB=30 cm și AA'=40cm. În această prismă se pune apă, nivelul apei ridicându-se la $\frac{3}{4}$ din înălțime. Dacă în această apă se află 28 de peștișori, arătați că în orice moment 2 peștișori se află la o distanță mai mică decât $10\sqrt{3}$ cm.

Prof. Benea Florin