Olympiad of Metropolises, Moscow

Blitz Contest, September, 5

Task 1

Calculate the following definite integral:

$$\frac{240}{\pi}\int_{\pi/6}^{\pi/3}\sin^2(x)\,dx$$

.

Task 2

There is only one liquid elemental nonmetal under normal conditions. Write down the atomic number of the corresponding element.

Task 3

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

Electric current of 5 A flows through an electric iron with resistivity of 20 Ohm. Calculate the heat produced by iron in 30 s (in kJ).

Task 4

A 20.0 g sample of mercury(II) oxide (M = 216.6) is heated to high temperature, causing it to decompose to metallic Hg and O_2 gas. What volume of O_2 is produced (measured at 0 ^{o}C, 1 atm)?

1. 1.03 L
2. 2.07 L
3. 4.14 L
4. 14.0 L

Task 5

Convert the hex number 37CF into binary number

Task 6

Which of the following substances (one mole each) gives the largest volume of oxygen during thermal decomposition?

1. HgO
2. H_2O_2
3. $KMnO_4$
4. $KClO_3$

Task 7

Parabola $y = ax^2 + bx + c$ intersects horizontal axis at two points.

Its vertex is $A(0,2)$.

The lines $y = kx + 5$ and $y = -kx + 5$ are tangent to the parabola at B and C respectively.

ABC is an equilateral triangle.

Find $4 \cdot (a + b + c)$.

Task 8

What will be result if one time left shift operation held on number 6?

For example in C++:

```
int sh1 = 6;

int sh2 = sh1 << 1;

cout << sh2;
```

Task 9

Positive real numbers x and y are such that $x + y = 1$.

Find the largest integer C such that inequality $4/x + 2/y \geq C$ holds for any such x and y.

Task 10

The valency of which chemical element cannot exceed IV?

Sulfur (S);

phosphorus (P);

nitrogen (N);

chlorine (Cl)?

In the answer, give the relative molecular mass (integer) of the higher oxide of the chosen element.

Task 11

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

An airplane flies against the wind from A to B in 8 hours. The same airplane returns from B to A, in the same direction as the wind, in 7 hours. Find the ratio of the speed of the airplane (in still air) to the speed of the wind.

Task 12

To order the elements of the array: {32,74,25,53,28,43,86,47} from small to large, every time you can exchange any two elements. At least you need to exchange elements __ times.

Task 13

The density of an ideal gas at 90 degrees Celsius and 94.0 kPa is 2.80 g/L. What is the molar mass of this gas (in g/mol)? Give the integer answer without units.

Task 14

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

A tire makes 400 revolutions per minute when the car is traveling at 72 km/h. What is the tire circumference (in m)?

Task 15

Find the number of all integers n, $1 \leq n \leq 1000$, such that $n^2 + 7n + 1$ is divisible by 33.

Task 16

Adel went to the Middle East Comic Con in Dubai, and he took a short course on how to make web comics. He used special software to draw his simple cartoon characters fill them with color. He was not able to put a lot of detail in the image, but comics do not need lots of detail.

The software saved the image in a math–based format that will allow the image to be used in many different ways without becoming Pixelated. What image type was used?

1. Low resolution
2. Color coding
3. Compression
4. Vector

Task 17

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

A ball is dropped from a height h without initial speed. At height y<h, it bounces elastically (i.e., at the same speed) off a board in the horizontal direction. The height y is chosen so that the distance of ball flight in horizontal direction is maximal. Determine this distance in the units of h.

Task 18

Acetic acid reacts with ethanol in the presence of an acid. Give the relative molecular mass (integer) of the organic product.

Task 19

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

Two moles of a monoatomic ideal gas undergo two transformations. The first one is isochoric from A (V_a, T_a, $P_a = 2$ kPa) to B (V_a, T_b, $P_b = 6$ kPa). The second one is isothermal from B to C (T_b, $V_c = 1$ m^3, $P_c = 3$ kPa). Find Q (in J) absorbed by the transformation $A \to B$.

Task 20

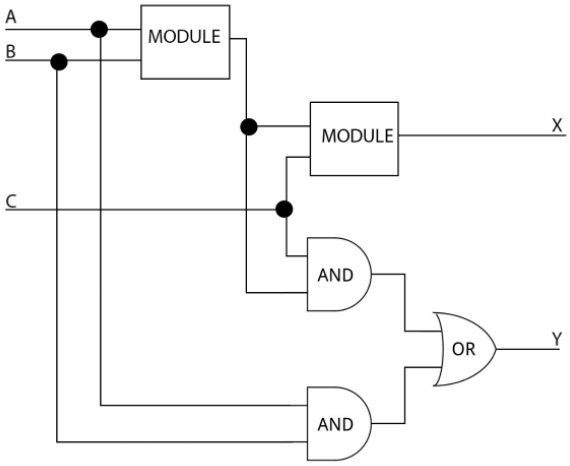
How many solutions does the equation $2\cos^2(x) + \cos(x) = 1$ have on the closed interval $[0; 10]$?

Task 21

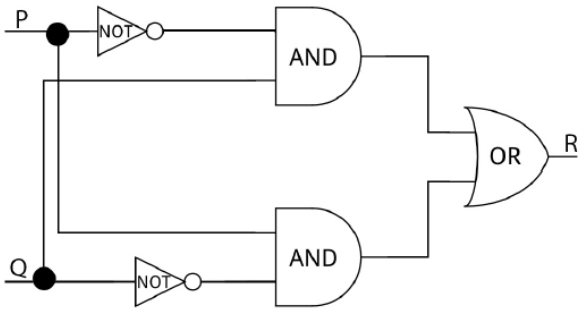
How many grams of iron should react with an excess of hydrochloric acid, so that the obtained hydrogen could reduce copper(II) oxide to get 8 g of copper? Give the integer answer without units. (Use atomic masses: Fe – 56, Cu – 64.)

Task 22

The following circuit board receives A, B and C inputs. Logic gates produce X and Y values:



There is another circuit board called MODULE, which produces R from P and Q:



First, complete the chart based on A, B and C values (0=false, 1=true)

A	B	C	X	Y
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

What's the sum of elements in X and Y columns?

(write just this value as an answer)

Task 23

A two-step mechanism was proposed for the catalytic decomposition of ozone:

$Cl + O_3 \rightarrow ClO + O_2$,

$ClO + O_3 \rightarrow Cl + 2O_2$.

What substance is a catalyzer of this reaction?

1. Cl
2. O_3
3. ClO
4. O_2

Task 24

Given that x and y are integers and $(x^2+y^2)(x-2y+7)=2xy$, find the maximum value of $x+y$.

Task 25

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

Uranium 238 (^{238}U) undergoes a series of alpha and beta decays until it terminates with stable lead-206 (^{206}Pb). What is the number of alpha decays in that decay chain?

Task 26

Pascal	C

var n, k: integer;
begin
  readln(n);
  k := 1;
  while k*k <= n do
  k := k + 1;
  writeln(k)
end.
	#include <stdio.h>
	int main(){
	  int n, k;
	  scanf("%d", &n);
	  k = 1;
	  while (k*k <= n)
	  k = k + 1;
	  printf("%d",k);
	  return 0;
	}

What is the output of this program if the input is 2016?

Task 27

How many grams of KBr will be obtained from a mixture containing 13.2 g of potassium (K) and 22.2 g of bromine (Br_2)? (The relative atomic mass of potassium (K) is 39.1, and that of bromine (Br) is 79.9.) Give the answer rounded to an integer, without units.

Task 28

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

A bicyclist can generate a maximum propulsive of 500 W during cycling. The force of air resistance is $F = bv$, when b is a constant given by 5 Ns/m, and v is velocity. Without wind, what is the maximum speed (in m/s) of the bicycle when cycling is conducted on a horizontal ground?

Task 29

Convert number 1020 from base 3 into base 4.

Task 30

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

Seven 7.5 W Christmas tree lights are connected in series to each other and to a 105 V source. What is the resistance (in ohms) of a light bulb?

Task 31

Find the sum of roots of the equation

$$|(x-1)(x-6)|\cdot(|x+2|+|x-8|+|x-3|) = 11(x-1)(6-x).$$

Task 32

Oxidation of 98 g of an unknown metal by an excess of oxygen gives 122 g of the metal oxide. What is the oxidation number of the metal in this oxide? Give the integer value without sign (for example, 4)

Task 33

An algorithm “Editor” changes an input sequence of digits (without blanks). “Editor” has following functions:

A) Replace(v, w). This function replaces first appearance of sequence v by sequence w.

B) Find(v). This logic function return True if sequence v is in the input string like substring and False otherwise.

The algorithm description is

```
while find(19) or find(299) or find(3999)
     replace(19, 2)
     replace(299, 3)
     replace(3999, 1)
end while
```

The input string for the algorithm is digit 1 and then 98 digits 9: 1999…999. What is the output of the algorithm?

Task 34

Find the maximum value of the function

$f(x) = 10\sin(x+0.3\pi) - 24\sin(0.8\pi + x)$.

Task 35

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

A stone is thrown vertically at a speed of 30 m/s. What is the maximum elevation of the stone if $g = 10$ m/s^2? Neglect air drag.

Task 36

Two players play a game. At the start of the game, there are 6 marbles in the box.

Each player, in his turn, adds 1 or 2 marbles to the box or doubles the number of marbles (he decides by himself what exactly to do). The player who has 16 marbles or more looses and other player wins.

If the first player can win under the initial terms and second player playing optimally, write result of the first turn. If he can't win, write number 0.

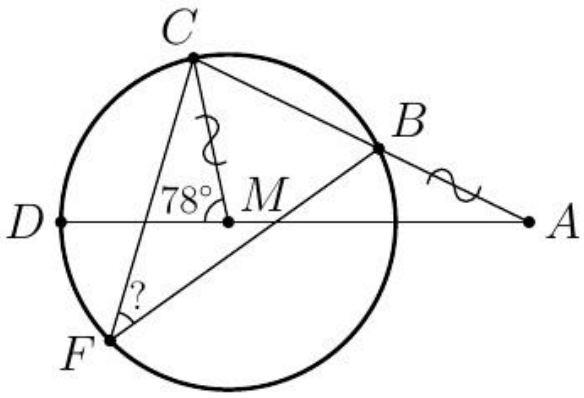
Task 37

See figure.

Point M is the center of the circle, BA equals to radius of the circle, $\angle CMD = 78^\circ$.

Find $\angle BFC$.

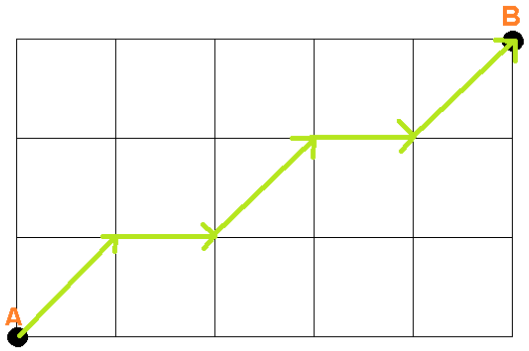
Give the answer in degrees.



Task 38

Jekardah Mayor, held a party in a city park. At this party there are N people. Because he wants to make a surprise, Mayor will select one of the party guest to cooperate.

During the party, the guests will be spread in the park of size $R * C$ blocks that is very large. From their position at that time, Mayor Jekardah will choose one person, that is when he scream, the voice can be heard by all of the people in a shortest time. The sound of people shouting 8 propagating direction of the wind with a speed of 1 block per second. In the following picture, sound propagation from person A to person B is as far as 5 blocks.



The following 10 lines contain two integers X_i and Y_i which is the position of the i-th party guest.

Determine the minimal time when the last person to hear sound of chosen guest by Mayor Jekardah (first of all guess who was chosen).

```
5 3

1 3

15 6

19 3

2 7

5 7

20 10

16 5

17 9

3 4
```

Task 39

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

A point-like object is placed on the optical axis of a thin converging lens. At which distance from the lens, in the units of its focal length, should the object be placed in order to be closest to its real image?

Task 40

26.4 g of a mixture of FeS and FeS_2 reacts with an excess of oxygen giving 20.8 g of the solid product (Fe_2O_3). What is the mass percentage (%) of FeS in this mixture? Give the integer answer without units.

(Use atomic masses: Fe – 56, S – 32.)

Task 41

You are given a rectangle with sides of length 5 and 9. It is divided into square cells with sides of length 1. The bottom left corner cell has coordinates (0, 0), while the top right one has coordinates (4, 8).

You are located in the bottom left corner cell. You can move from any cell to the right or to the top to an adjacent cell.

The cells with coordinates (2, 0) and (1, 6) are impassable.

Find the number of ways to go to the top right corner cell.

Task 42

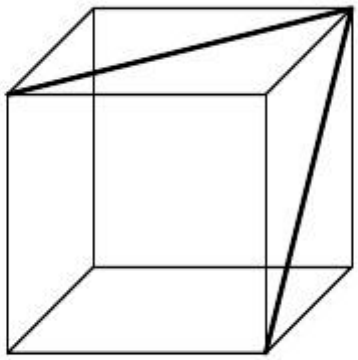
160 cm^3 of hydrochloric acid reacts with potassium permanganate in a stoichiometric relation, thus producing 12.6 g of manganese(II) chloride. What is the molar concentration of hydrochloric acid (in mol/dm^3)? Give the integer answer without units.

Task 43

Given a cube, consider diagonals of two faces such that the two diagonals share a vertex (figure).

Find the angle between diagonals.

Give the answer in degrees.



Task 44

Array A has 15 positive integers indicating the price for visiting a station on a linear road:

{10, 5, 20, 10, 30, 40, 30, 30, 30, 50, 100, 2, 10, 3, 20}

Jerry starts at the first station and he wants to get to the last station in the most inexpensive route. When Jerry is in station i he has two options: to move to station $i+1$ or skip it and getting straight to station $i+2$.

Jerry has to pay for each station he visits. What is the minimal cost for Jerry's trip including start and finish values? (For example, for array 10 2 9 5 the minimal cost is 17 = 10 + 2 + 5)

Task 45

In the Cartesian coordinate space,

line g passes through point $(10,0,7)$ and is parallel to vector $(1,0,1)$,

while line h passes through point $(2,3,5)$ and is parallel to vector $(1,0,0)$.

Compute the shortest distance between the lines.

Task 46

Mixture of calcium sulfate hemihydrate $CaSO_4 \cdot 0.5H_2O$ and water is used in medicine to make plaster splints. Mixture hardens resulting in $CaSO_4 \cdot 2H_2O$ formation. What volume (mL) of water must be added to 290 g of calcium sulfate hemihydrate to harden all its amount? (Molar mass of $CaSO_4$ is 136 g/mol). Give the integer answer without units.

Task 47

A computer program reads five integers of different magnitude and finds out their relative order, i.e. which one is the smallest, the second smallest etc. To this end, the program does pairwise comparisons on the integers.

What is the minimal number of comparisons that is always sufficient to complete this job? (Apparently, four comparisons is minimal, but not always sufficient, while comparing each integer against each other, i.e. 10 comparisons, is sufficient, but not minimal.)

Task 48

A triangle ABC is given with sides $AC = 5$, $BC = 7$ and circumradius $R = 7/\sqrt{3}$.

Find the length of the smallest side AB of the triangle.

Task 49

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

A rectangular slab A of mass $m = 2.0$ kg lies on a horizontal table and a slab B of mass $M = 5.0\ kg$ lies on top of it. The coefficient of friction between slabs and the slabs and the table is $\mu = 0.2$, $g = 10 m \cdot s^{-2}$. Determine a friction force between the slabs if a constant horizontal force $F = 14$ N is exerted on the slab B.

Task 50

Given are five substances: 1) H_2SO_4, 2) $KMnO_4$, 3) $AlCl_3$, 4) KOH, 5) K_2S. Arrange these substances in an increasing order of pH of their 0.1 M water solutions. In your answer, give the numbers of the substances without spaces and commas (for example, 12345).

Task 51

The N-dictionary based on the alphabet a, b, c contains all the words with the number of letters not exceeding N. The words in the dictionary are arranged in the lexicographical way. For instance, if N=2, the words of the dictionary are arranged as follows: a, aa, ab, ac, b, ba, bb, bc, c, ca, cb, cc.

For the given $N = 4$ define the serial number of the word bbc 4-dictionary. For example in the 2-dictionary the serial number of the word ba is 6, and that for the word c is 9.

Task 52

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

Determine the work (in J) required to move a charge of $+2.0$ C at a constant speed from a point with zero potential to a point with potential $+6.0$ V.

Task 53

What is the output of following code for foo(5)?

```
public class test{
     int x=0;
     public int foo(int n){
          int a = 0;
          x++;
          if (n == 1){
               a = 1;
               System.out.println(x);
          }
          else if (n%2 == 0) a = foo(n/2);
          else a = foo(2*n + 2);
     return a;
     }
}
```

Task 54

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

A mole of helium expands according to the law $p = \alpha / V^2$ ($\alpha = const$ and P is pressure), so that its volume increases twofold and the internal energy decreases by $\Delta U = 2493$ J. Determine the helium initial temperature. $R = 8.31$ J/(mol K).

Task 55

Let $\mathcal{R}$ be the set of all triples (x, y, z) of non-negative integers such that $x + y + z = 100$ and at least one of two conditions holds: $x \geq 28$ or $z \geq 42$.

For example, one such triple is $(27, 12, 61)$.

How many elements does set $\mathcal{R}$ have?

Task 56

A voltaic cell is made of Pb and Fe as well as of 1 M solutions of lead(II) nitrate and iron(II) sulfate. Using only the data given below

Reaction	E^o
$Pb^{4+}(aq) + 4e \rightarrow Pb(s)$	0.837 V
$Pb^{4+}(aq) + 2e \rightarrow Pb^{2+}(aq)$	1.800 V
$Fe^{2+}(aq) + 2e \rightarrow Fe(s)$	–0.439 V

determine the standard emf of the voltaic cell, assuming that most stable species are formed in the solution at each electrode. In the answer, give the integer value of emf*1000 (without units) (for example, 1800 instead of 1.800).

Task 57

Consider the function f, defined as follows:

```
f(n):
    if n > 100
        return n - 10
    else

return f(f(n + 11))
```

What is the value returned by calling f(95)?

Task 58

60 L of a mixture of ethylene and acetylene can react with 110 L of hydrogen. Find the molar ratio C_2H_2 / C_2H_4 in this mixture. Give the integer value.

Task 59

There are 17 different balls, 5 of them red, 5 yellow, 4 green and 3 blue.

We take five of them.

How many ways are there to choose more red balls than balls of any other color?

Task 60

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

An electric boiler is not capable of heating 1 litre of water to the boiling point. When the boiler is switched off its temperature decreases by 1 °C for 1 min. What is the boiler power?

Task 61

Each face of a cube is painted either black or white. How many distinct ways of colouring the cube are there? (The faces are not distinguishable and 2 ways of colouring are considered distinct if it is not possible to obtain one from the other using rotations of the cube.)

Task 62

Pinocchio arranges all integers from 1 to 100 in a circular sequence.

For each number that is larger than the sum of its neighbours he receives from Geppetto a gold coin.

What is the maximum number of coins Pinocchio can receive

Task 63

Arrange the hereunder substances in a row, in which every substance (except the first one) can be obtained by oxidation of the previous one. In the answer, give the numbers of the substances without spaces and commas (for example, 12345).

Substances:

1) CH_3OH,

2) HCOOH,

3) CH_4,

4) CO_2,

5) CH_2O.

Task 64

There are two silver and 24 gold coins.

From these 26 coins 13 are selected randomly.

Determine the probability that exactly one silver coin will be among the selected coins.

Give answer in percents.

Task 65

Let's call a number "increasing" if every digit in it from left to right is less than the next digit, for example 1234 or 24789.

Find out how many of these numbers exists that consist of 4 adjacent prime numbers, for example 2357 (2, 3, 5, 7) or 2345789 (2, 3, 457, 89).

Task 66

Bando and Bandi were given the job to paint a wall.

Bando can finish the job by himself in 3 hours, while Bandi can finish by himself in 4 hours.

They started together at 12:00.

While doing the job, they had a quarrel.

They argued for 10 minutes and during that time no one was working.

After the quarrel, Bandi abandoned the job and Bando finished painting alone.

If Bando finished painting at 14:25, for how many minutes did they work together before the quarrel started?

Task 67

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

A 1 kg pulley is suspended from the elevator ceiling. A light inextensible rope is threaded through the pulley, the rope ends are loaded with two weights of 2 and 3 kg. The elevator is riding upward at a constant acceleration $a = 1$ m/s^2 and the heavier weight is accelerating downward, its acceleration equals $2a$ relative to the ground. Determine acceleration of the lighter weight relative to the ground.

Task 68

Ethanol can be produced either by direct hydration of ethylene or by the biological method using waste crops as a raw material. To obtain 370 L of ethanol (ρ = 0.8 g/cm^3), a bioethanol plant uses one ton (1000 kg) of wasted wheat. How many kilograms of wasted wheat are required to produce the same amount of ethanol as can be obtained from 1000 kg of ethylene? Assume, that there are no losses in the production process. (Molar mass of ethanol is 46 g/mol). Give the integer answer without units.

Task 69

Messages that are transferred through a communication channel only contain letters A, B, C, D, E, F. Binary code is used for transferring, and this code allows for unambiguous decoding. For letters A, B, C code words are A: 11, B: 101, C: 0. What is the minimal possible sum of code lengths of D, E and F codes if the code always allows for unambiguous decoding?

Task 70

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

A vertically suspended massless spring of initial length $l = 10$ cm and a spring constant $k = 10\frac{N}{m}$ is loaded with a weight of $m = 1$ kg. The weight is released from the rest. Determine the amplitude of weight oscillations (in m). Assume $g = 10$ m/s^2.

Task 71

In a theatre, there are 20 rows of 14 seats each.

The tickets for the seats in the front n rows cost $5/3$ the cost of the other tickets.

Yesterday the total income was 181.6 times the cost of a seat in the front rows;

knowing that only 4 seats of the theatre remained unsold, calculate the value of n.

Task 72

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

A small cart of mass m is initially at rest. It collides with a large cart of mass $2m$ riding at a speed of 3 m/c. The large cart transfers half of its kinetic energy to the little cart. Determine the velocity of little cart after the collision.

Task 73

How many different sets of values of boolean variables x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9, x_{10}, x_{11}, x_{12} satisfy all of the following conditions? The sign $\overline{\ }$ means NOT operation, sign & means AND operation, sign $\vee$ means OR and 0 means False.

$$\begin{cases} \overline{x_1 = x_2}\&(x_1\&\overline{x_3} \vee \overline{x_1}\&x_3) = 0 \\ \overline{x_2 = x_3}\&(x_2\&\overline{x_4} \vee \overline{x_2}\&x_4) = 0 \\ \dots \\ \overline{x_{10} = x_{11}}\&(x_{10}\&\overline{x_{12}} \vee \overline{x_{10}}\&x_{12}) = 0 \end{cases}$$

Task 74

A helicopter travels between two cities daily, and its normal speed in either direction is 120 km/h.

However, on a windy day, its average speed was 140 km/h in one direction and 100 km/h in the other direction, so the entire trip was 15 minutes longer than usual.

What is the distance between the two cities in kilometers?

Task 75

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

A weight of 150 g composed of two weights glued together is suspended by a vertical spring. Initially the weight is at rest. When the glue dried up the lower weight of 50 g fell off. What is the upper weight acceleration (absolute value) just after the lower one has fallen off?

Task 76

A box contains 501 pieces of identical coins. Each coin weighs 4.13 grams and is composed of gold and silver. We dissolve one of the coins in 12.6 g of 50% (in mass fraction) nitric acid and observe liberation of a brown gas. 0.06 moles of nitric acid remains after the reaction is complete. How many rubles does the box cost in total after the experiment if 1 mol of gold costs 5 rubles and 1 mol of silver costs 2 rubles? Give the integer value.

Task 77

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

The Sun radiates $2.3 \cdot 10^{28}$ J of energy per minute. The minimum distance between Mars and the Sun is 207 Gm. What is the maximum flux of solar radiation on the Mars surface? The answer should be given in W/m^2 and rounded to the nearest integer. Energy flux is defined as an energy of radiation incident perpendicular to a surface per unit area per second.

Task 78

The average score in a class on an exam is 70.

The average of students who scored below 60 is 50.

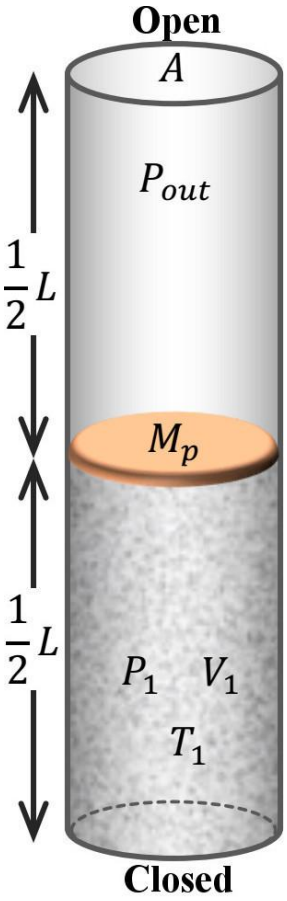
The average of students who scored 60 or more is 75.

If the total number of students in this class is 20, how many students scored below 60?

Task 79

The answer should be given in SI-units and rounded to the nearest integer, unless otherwise is stated. $g = 10$ m/s^2.

In figure below, a thermally insulated vertical cylinder with height $L = 20$ meter and cross sectional area $A = 0.1$ m^2 is planted on the ground. The top part of the cylinder is open to the atmosphere with atmospheric pressure $P_{out} = 10^5$ Pa. The bottom part of the cylinder is closed. The lower half of the cylinder contains a high pressure air under a piston with mass $M_p = 300$ kg. Initially, the piston is held in place by a force so that it does not move. The data of the enclosed air is: pressure $P_1 = 3 \times 10^5$ Pa, volume $V_1 = 1$ m^3, temperature $T_1 = 300$ K, and heat capacity ratio $\gamma = c_p/c_v = 1.4$.



The piston is then released such that the enclosed air starts to expand and the piston moves upward. Assume in the subsequent process that the pressure and temperature of the enclosed air are uniform. What is the velocity of the piston at the top of the cylinder? The gravitational potential energy of the air can be ignored. $g = 10$ m/s^2. The answer should be given in m/s and rounded to the nearest integer.

Task 80

When the travelers in Jules Verne's novel "Les Enfants du capitaine Grant" (The Children of Captain Grant) were about to feast on a guanaco (South American lama) they had shot, they discovered that the meat had an unpleasant sour taste.

"The meat was too long kept, was it?" asked one of the travelers.

"No, but the meat had walked too much!" replied geographer Paganel and explained, "The guanaco is only good for eating when it is killed in a state of rest. If it has been long hunted, and gone over much ground before it is captured, it is no longer eatable."

For the compound that spoiled the travelers' meal, calculate the sum of the relative molecular weight and the total number of atoms in the compound molecule.

(Use integer atomic masses)