**Лабораторная работа №6**

**Код:**

using System;

namespace Test\_2

{

class MainClass

{

public static void Main(string[] args)

{

//1st

Console.WriteLine("1st exercise");

OutputOptions('\n');

Console.ReadKey();

//2nd

Console.WriteLine("2nd exercise");

Console.WriteLine("Площадь треугольника с катетами 5 и 7 равна " + TriangleArea(5, 7, 0.5) + "\n");

Console.ReadKey();

//3rd

Console.WriteLine("3rd exercise");

double r = Convert.ToDouble(Console.ReadLine());

Console.WriteLine("Длина окружности с заданным радиусом равна {0}\n", CircleLength(r));

Console.ReadKey();

//4th

Console.WriteLine("4th exercise");

Console.Write("Количество углов: ");

int n = Convert.ToInt32(Console.ReadLine());

Console.WriteLine("Sum of angles is = {0}\n", SumOfAngles(n));

Console.ReadKey();

//5th

Console.WriteLine("5th exercise");

double a = Convert.ToDouble(Console.ReadLine());

double b = Convert.ToDouble(Console.ReadLine());

double c = Convert.ToDouble(Console.ReadLine());

TrigonomQuantities(a, b, c, out double sin, out double cos, out double tan, out double cot);

Console.WriteLine("Sinus is {0}", (a / c));

Console.WriteLine("Cosine is {0}", (b / c));

Console.WriteLine("Tanget is {0}", (a / b));

Console.WriteLine("Cotangent is {0} \n", (b / a));

Console.ReadKey();

//6th

Console.WriteLine("6th exercise");

Console.WriteLine("Введите длины сторон параллелепипеда:");

a = Convert.ToDouble(Console.ReadLine());

b = Convert.ToDouble(Console.ReadLine());

c = Convert.ToDouble(Console.ReadLine());

Console.WriteLine("Объём половины заданного параллелепипеда " + Amount(a, b, c) + "\n");

Console.ReadKey();

//7th

Console.WriteLine("7th exercise");

int x = Convert.ToInt32(Console.ReadLine());

int y = Convert.ToInt32(Console.ReadLine());

Console.WriteLine("Радиусы: ");

int r1 = Convert.ToInt32(Console.ReadLine());

int r2 = Convert.ToInt32(Console.ReadLine());

Console.WriteLine("Ответ 7го задания при заданных значениях: " + Area7th(x, y, r1, r2));

Console.ReadKey();

//8th

Console.WriteLine("\n8th exercise");

Console.WriteLine("Введите значения:");

a = Convert.ToDouble(Console.ReadLine());

b = Convert.ToDouble(Console.ReadLine());

c = Convert.ToDouble(Console.ReadLine());

QadraticEquat(a, b, c);

Console.ReadKey();

//9th

Console.WriteLine("\n9th exercise");

Console.WriteLine("Введите значения сторон треугольника:");

a = Convert.ToDouble(Console.ReadLine());

b = Convert.ToDouble(Console.ReadLine());

c = Convert.ToDouble(Console.ReadLine());

Console.Write("Площадь такого треугольника " + TriangleExistNoIF(a, b, c) + "\n");

Console.ReadKey();

//10th

Console.WriteLine("\n10th exercise");

Console.WriteLine("Введите число для проверки чётности:");

a = Convert.ToDouble(Console.ReadLine());

Console.WriteLine("Число чётное: " + Parity(a));

Console.ReadKey();

//11th

Console.WriteLine("\n11th exercise");

Console.WriteLine("Имя пользователя " + Environment.MachineName);

Console.WriteLine("Введите своё имя!");

string name = Console.ReadLine();

Console.WriteLine(HelloAndBye(name));

Console.ReadKey();

//12th

Console.WriteLine("\n12th exercise");

double t = Convert.ToDouble(Console.ReadLine());

Console.Write("Ответ: " + Example1(t) + "\n");

Console.ReadKey();

//13th

Console.WriteLine("\n13th exercise");

a = Convert.ToDouble(Console.ReadLine());

Console.WriteLine("Ответ: " + Example2(a));

Console.ReadKey();

//14th

Console.WriteLine("\n14th exercise");

a = Convert.ToDouble(Console.ReadLine());

Console.WriteLine("Ответ: " + Example3(a));

Console.ReadKey();

//15th 9var

Console.WriteLine("\n15th exercise and 9th variant");

a = Convert.ToDouble(Console.ReadLine());

b = Convert.ToDouble(Console.ReadLine());

Example4(a, b);

Console.ReadKey();

//16th 9var

Console.WriteLine("\n16th exercise and 9th variant");

const double fi = 1.2131;

Example5(fi, out double res1, out double res2);

Console.WriteLine("Fi по умолчанию равно " + fi);

Console.WriteLine("Fi после расчётов " + (res1 + res2));

Console.ReadKey();

}

public static void OutputOptions(char endl)

{

Console.WriteLine("Гринь\nАлександр\n");

Console.WriteLine(@"Гринь

Александр

");

Console.WriteLine("Гринь");

Console.WriteLine("Александр\n");

Console.WriteLine("Гринь{0}Александр{0}", endl);

}

public static double TriangleArea(double a, double b, double c)

{

return (a \* b \* c);

}

public static double CircleLength(double r)

{

return (r \* Math.PI \* 2);

}

public static int SumOfAngles(int n)

{

return (180 \* (n - 2));

}

public static void TrigonomQuantities(double a, double b, double c, out double sin, out double cos, out double tan, out double cot)

{

sin = a / c; cos = b / c; tan = a / b; cot = b / a;

}

public static double Amount(double a, double b, double c)

{

return (a \* b \* c) - (a \* b \* (c / 2));

}

public static double Area7th(int x, int y, int r1, int r2)

{

while ((r1 >= Math.Min(x, y)) || (r2 >= Math.Min(x, y)))

{

Console.WriteLine("Введите корректные значение!");

r1 = Convert.ToInt32(Console.ReadLine());

r2 = Convert.ToInt32(Console.ReadLine());

}

double result = (x \* y) - (Math.PI \* Math.Pow(r1, 2)) - (Math.PI \* Math.Pow(r2, 2));

return result;

}

public static void QadraticEquat(double a, double b, double c)

{

double d = Math.Pow(b, 2) - 4 \* a \* c;

if (d > 0)

{

double x1 = (-b + Math.Sqrt(d)) / (2 \* a);

double x2 = (-b - Math.Sqrt(d)) / (2 \* a);

Console.WriteLine("1й корень уравнения:" + x1);

Console.WriteLine("2й корень уравнения:" + x2);

}

else if (d == 0)

{

double x = (-b) / (2 \* a);

Console.WriteLine("Корень уравнения:" + x);

}

else

{

Console.WriteLine("Отрицательный дискриминант!");

}

}

public static double TriangleExistNoIF(double a, double b, double c)

{

double p = (a + b + c) / 2;

double area = Math.Sqrt(p \* (p - a) \* (p - b) \* (p - c));

bool isExist = ((a + b > c) && (a + c > b) && (b + c > a)) ? true : false;

if (isExist)

{

return area;

}

return 0;

}

public static bool Parity(double a)

{

bool isParity = (a % 2 == 0) ? true : false;

return isParity;

}

public static string HelloAndBye(string name)

{

if (Environment.MachineName == name)

return "HELLO!";

else

return "Bye";

}

public static double Example1(double t)

{

double result = (2 \* (Math.Sqrt(1 + 0.25 \* Math.Pow((Math.Sqrt(1 / t) - Math.Sqrt(t)), 2)))) / (Math.Sqrt(1 + 0.25 \* Math.Pow(Math.Sqrt(1 / t) - Math.Sqrt(t), 2) - (0.5 \* (Math.Sqrt(1 / t) - Math.Sqrt(t)))));

return result;

}

public static double Example2(double a)

{

while (a == 1)

{

Console.WriteLine("Знаменатель равен нулю!");

a = Convert.ToDouble(Console.ReadLine());

}

double first = 1 / (Math.Sqrt(a) + Math.Sqrt(a + 1));

double second = 1 / (Math.Sqrt(a) - Math.Sqrt(a - 1));

double third = 1 + (Math.Sqrt((a + 1) / (a - 1)));

return (first + second) / third;

}

public static double Example3(double x)

{

double result = (2 \* (Math.Pow(x, 4) + (4 \* Math.Pow(x, 2) - 12)) + Math.Pow(x, 4) + (11 \* Math.Pow(x, 2)) + 30) / (Math.Pow(x, 2) + 6);

return result;

}

public static void Example4(double x, double y)

{

double result\_1 = Math.Pow(Math.Cos(x), 4) + Math.Pow(Math.Sin(y), 2) + (0.25 \* Math.Pow(Math.Sin(2 \* x), 2)) - 1;

double result\_2 = Math.Sin(x + y) \* Math.Sin(y - x);

Console.WriteLine("Ответы:\n{0}\n{1}", result\_1, result\_2);

}

public static void Example5(double Fi, out double result\_fi1, out double result\_fi2)

{

double x = 182.5;

double y = 18.225;

double z = (-3.298) \* 0.01;

double fi = Fi;

result\_fi1 = Math.Abs(Math.Pow(x, 0.5) - Math.Pow((y / x), (1 / 3)));

result\_fi2 = (y - x) \* ((Math.Cos(y) - ((z) / (y - x))) / (1 + Math.Pow((y - x), 2)));

}

}

}

**Скриншоты:**



