Weak 03

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Problem 301:

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#include <iostream> // turn on standard library(input, output) || подключаем стандартную библеотеку(ввода и вывода)

using namespace std; // namespace statement || указание пространства имен

int main() // main function, entry point || главная функция и точка входа в программу

{

float x, y, z;

cin >> x >> y >> z; // create and input a variables || создание и ввод переменных

if (x < y && y < z) // check the condition || проверяем условие

cout << "YES";

else

cout << "NO";

return 0;

}

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Problem 302:

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#include <iostream>

using namespace std;

int main()

{

float a, b, c;

cin >> a >> b >> c; // create and input a variables || создание и ввод переменных

if (a <= b and b <= c) //check the condition and if condition true, output 2a|| проверяем условие и если верны выводим 2а

{

cout << a \* 2 << endl;

cout << b \* 2 << endl;

cout << c \* 2 << endl;

}

else //if condition false,output |a| || если условия неверны выводим модуль числа а

{

if (a < 0) //if a> 0, I need multiply on – 1 || если a>0 мне нужно умножить на -1

a = a \* (-1);

if (b < 0)

b = b \* (-1);

if (c < 0)

c = c \* (-1);

cout << a << endl;

cout << b << endl;

cout << c << endl;

}

return 0;

}

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Problem 303:

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#include <iostream>

#include <math.h> //include math library to use pow,sqrt

using namespace std;

int main()

{

float a, b, c, D;

cin >> a >> b >> c; // create and input a variables

D = pow(b, 2) - 4 \* a \* c; // find the discriminant by the formula D = b^2 - 4ac

if (b == 0 && c == 0) //if b and c are equal 0, thеn output 0

cout << 0;

else if (D < 0)//if the discriminant is less than 0 then the equation has no solution

cout << "no solution";

else if (D == 0) //if the discriminant = 0 then the equation has 1 root

cout << -b / (2 \* a);

else //if the discriminant is more than 0 then the equation has 2 roots

{

double x1, x2;

x1 = (-b + sqrt(D)) / (2 \* a);

x2 = (-b - sqrt(D)) / (2 \* a);

cout << x1 << " " << x2; //finding first and second root and output them

}

return 0;

}

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Problem 304:

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#include <iostream>

#include <math.h> //include math library

using namespace std;

int main()

{

float x, y, z, maximum, minimum;

cin >> x >> y >> z; // create and input a variables

maximum = max(z, max(x, y)); //find the maximum number using the max function

minimum = min(z, min(x, y)); //find the minimum number using the min function

cout << minimum << " " << maximum;

return 0;

}

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Problem 305:

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#include <iostream>

using namespace std;

int main()

{

double x, y, z;

cin >> x >> y >> z; // create and input a variables

if (x + y > z && x + z > y && y + z > x) //check the condition, If the sum of the two sides is greater than the third, then the triangle exists

cout << "YES";

else

cout << "NO";

return 0;

}

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Problem 306:

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#include <iostream>

using namespace std;

int main()

{

int year;

cin >> year; // create and input a variable

if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) //check the condition, determine leap year or not.

cout << "366";

else

cout << "365";

return 0;

}

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Problem 307:

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#include <iostream>

#include <cmath>

using namespace std;

int main()

{

int day, month, year;

cin >> day >> month >> year; // create and input a variables

if ((0 < year && year < 100000) && (0 < month && month <= 12)) //12 months per year

{

if ((0 < day && day <= 31) && (((1 <= month && month < 8) && month % 2 == 1) || ((8 <= month && month <= 12) && month % 2 == 0)) && month != 2) // if month has 1-31 days,output yes

cout << "yes";

else if ((0 < day && day <= 30) && (((1 <= month && month < 8) && month % 2 == 0) || ((8 <= month && month <= 12) && month % 2 == 1)) && month != 2) // if month has 1-31 days,output yes

cout << "yes";

else

{

if (((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) && day == 29) //if year is leap and has 29,then output yes

cout << "yes";

else if (0 < day && day <= 28) //if year is simple and has 1-28 days,then output yes

cout << "yes";

else // if day is more than 28 and less than 1,then output 0

cout << "no";

}

}

else //if month is more 12 and less than 1,then output no

cout << "no";

return 0;

}

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Problem 308:

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#include <iostream>

using namespace std;

int main()

{

int day, start\_year, year;

cin >> year;

start\_year = 2002;

day = 7;

for (start\_year; start\_year <= year; start\_year++) // Review the year since 2002 and introduced.

{

if (day == 1 && start\_year != 2000) //if the year is 1 then we must return 7 or 6

{

if ((start\_year % 4 == 0 && start\_year % 100 != 0) || (start\_year % 400 == 0)) // If it’s a leap year, it’s 6

day = 6;

else // if the normal year is 7

day = 7;

}

else //Otherwise we have to take one or two.

{

if ((start\_year % 4 == 0 && start\_year % 100 != 0) || (start\_year % 400 == 0)) // If it’s a leap year, we’re minus two days this year.

day -= 2;

else // If the year is normal then just each iteration minus 1

day--;

}

}

cout << day;

return 0;

}

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Problem 309:

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#include <iostream>

using namespace std;

int main()

{

int day, month, year;

cin >> day >> month >> year;

if ((0 < day && day <= 31) && (((1 <= month && month < 8) && month % 2 == 1) || ((8 <= month && month <= 12) && month % 2 == 0)) && month != 2)// find months in which from 1 to 31 days

{

if (day == 31) // if day == 31 then look further

{

if (month == 12) //if day = 31 and month = 12,then next day wiil be in new year

{

day = 1;

month = 1;

year++;

cout << day << " " << month << " " << year;

}

else // if day = 31 and month not equal 12 then next day will be in new month

{

day = 1;

month++;

cout << day << " " << month << " " << year;

}

}

else // if day is from 1 until 30,then day++;

{

day++;

cout << day << " " << month << " " << year;

}

}

else if ((0 < day && day <= 30) && (((1 <= month && month < 8) && month % 2 == 0) || ((8 <= month && month <= 12) && month % 2 == 1)) && month != 2)// find months in which from 1 to 31 days

{

if (day == 30)// if day == 30 then next day will be in new month

{

day = 1;

month++;

cout << day \* 0 + 1 << " " << month++ << " " << year;

}

else //if day is from 1 until 29,then day++;

{

day++;

cout << day << " " << month << " " << year;

}

}

else

{

if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) // if year is leap then look further

{

if (day == 29) // if day equal 29 then next day will be in new month

{

day = 1;

month++;

cout << day \* 0 + 1 << " " << month++ << " " << year;

}

else // else day++

{

day++;

cout << day << " " << month << " " << year;

}

}

else //if year is normal then look further

{

if (day == 28) //if day equal 29 then next day will be in new month

{

day = 1;

month++;

cout << day \* 0 + 1 << " " << month++ << " " << year;

}

else // else day++

{

day++;

cout << day << " " << month << " " << year;

}

}

}

return 0;

}

============================================================

Problem 310:

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#include <iostream>

#include <math.h>

using namespace std;

int main()

{

int number;

cin >> number;

cout << pow(2, number); //find 2 to the power of number

return 0;

}

============================================================

Problem 311:

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#include <iostream>

#include <math.h>

using namespace std;

int main()

{

int number;

int total = 1;

int i = 1;

cin >> number;

while (i <= number)// while number is more than I we multiply i to i;

{

total \*= i;

i++;

}

cout << total;

return 0;

}

============================================================

Problem 312:

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#include <iostream>

#include <math.h>

using namespace std;

int main()

{

int n;

cin >> n;

float total = 1; // create and input a variables

for (int i = 1; i <= n; i++)

total = total \* (1 + 1 / pow(i, 2)); //find answer by formula

cout << total;

return 0;

}

============================================================

Problem 314:

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#include <iostream>

#include <math.h>

using namespace std;

double RootN(int n) // create function with 1 variable

{

if (n == 1) // if n =1 then return total answer

return sqrt(2);

return sqrt(2 + RootN(n - 1)); //here the function calls itself and it’s called recursion and we shrink n

}

int main()

{

int n;

cin >> n;

cout << RootN(n) << endl; //call and output function RootN.

return 0;

}

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Problem 315:

============================================================

#include <iostream>

#include <math.h>

using namespace std;

int main()

{

float a, n, total;

cin >> a >> n;

total = 0; // create and input a variable

for (int i = 1; i <= n; i++) //find the product of the numbers without the multiplication operator.

total += a;

cout << total;

return 0;

}

============================================================

Problem 316:

============================================================

#include <iostream>

using namespace std;

int main()

{

float a, n;

cin >> a >> n;

double total = 1; // create and input a variable

for (int i = 0; i < n; i++)

total \*= (a + i); //find result by formula(a+n-1)

cout << total;

return 0;

}

============================================================ Problem 317:

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#include <iostream>

using namespace std;

int main()

{

int n, i;

float a, total = 0, c = 1;

cin >> a >> n; // create and input a variable

for (i = 0; i <= n; i = i + 1)

{

c = c \* (a + i); // find denominator by formula

total = total + 1.0 / c; //find result

}

cout << total;

return 0;

}

============================================================

Problem 318:

============================================================

#include <iostream>

#include <math.h>

using namespace std;

int main()

{

int n, i;

float a, total, c = 1;

cin >> a >> n;

total = 1 / a; // create and input a variable

for (i = 1; i <= n; i++)

{

c = 1 / pow(a, 2 \* i); //find denominator by formula

total += c; //find answer

}

cout << total;

return 0;

}

============================================================

Problem 319:

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#include <iostream>

#include <math.h>

#include<cmath>

using namespace std;

double fact(int number) //create function which find factorial of number

{

double i, total = 1;

for (i = 1; i <= number; i++)

total \*= i;

return total;

}

int main()

{

int x;

double total = 0;

int k = 1, i;

cin >> x; // create and input a variable

for (i = 1; i <= 13; i += 2)

{

total += k \* pow(x, i) / fact(i); // find rezult by formula

k \*= -1; //change mean to resut +result -result

}

cout << total;

return 0;

}

============================================================

Problem 320:

============================================================

#include <iostream>

#include <cmath>

using namespace std;

int main() {

double x, a, total;

int i, n;

cin >> x >> a >> n;

total = x + a; // create and input a variable

for (i = 1; i <= n; i++) {

total \*= total + a; //find result by formula

}

cout << total;

return 0;

}

============================================================

Problem 321:

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#include <iostream>

#include <cmath>

using namespace std;

int main()

{

double number, total = 1;

cin >> number; // create and input a variable

for (int i = 1; i <= 6; i++) // make 6 iterations

total = total \* ((number - pow(2, i)) / (number - pow(2, i) + 1)); //find rezult by formula (x-i)/(x-i-1)

cout << total;

return 0;

}

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Problem 322:

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#include <iostream>

using namespace std;

int main() {

double n, total;

cin >> n;

total = 103; // create and input a variable

for (int i = 101; i >= n; i -= 2)

total = i + 1 / total; //find denominator

cout << 1 / total; //output result;

return 0;

}

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Problem 323:

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#include <iostream>

using namespace std;

int main() {

double x;

cin >> x;

double sum = x \* x; // create and input a variable

for (int i = 256; i >= 2; i /= 2) {

sum = (i / sum) + (x \* x); //find denominator

}

cout << x / sum; //find result

return 0;

}

============================================================

Problem 324:

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#include <iostream>

#include <math.h>

using namespace std;

int main()

{

double total = 0; // create and input a variable

for (int i = 1; i <= 50; i++) // make 50 iterations

total += 1 / pow(i, 3); //find result by formula (1/i^3)

cout << total;

return 0;

}

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Problem 325:

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#include <iostream>

#include <string>

#include <cmath>

using namespace std;

int main()

{

double number;

double total = 0; // create and input a variable

for (int i = 1; i < 10; i++) // make 10 iterations

{

cin >> number; //input number

total = total + pow(number, i); //find result by formula a^1 + a2^2 +a3 ^3...

}

cout << total;

return 0;

}