**Код программы:**

#include <iostream>

using namespace std;

bool flag;

long int vozvedenie(long int a, long int x, long int p) {

long int current, result;

int j = 0;

int i\_mass2[30];

current = a;

result = 1;

while (x >= 1)

{

i\_mass2[j] = x % 2;

x /= 2;

j++;

}

int\* arr = new int[j];

arr[0] = a % p;

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

{

arr[i] = arr[i - 1] \* arr[i - 1];

arr[i] = arr[i] % p;

}

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

{

if (i\_mass2[i] == 1) {

result = result \* arr[i];

result = result % p;

}

}

return result;

}

bool proverka(int m, int k, int p)

{

if (m \* k > p)

flag = true;

else false;

return flag;

}

int shenks(int m, int k, int p, int y, int a)

{

long int res;

long int arr\_1[30];

long int arr\_2[30];

arr\_1[1] = y % p;

for (int i = 2; i <= m; i++)

{

arr\_1[i] = arr\_1[i-1] \* a;

arr\_1[i] = arr\_1[i] % p;

}

/\*for (int i = 1; i <= m; i++)

cout << arr\_1[i] << endl;\*/

arr\_2[1] = vozvedenie(a, m, p);

for (int i = 2; i <= k; i++)

{

arr\_2[i] = arr\_2[i-1] \* arr\_2[1];

arr\_2[i] = arr\_2[i] % p;

}

/\*for (int i = 1; i <= k; i++)

cout << arr\_2[i] << endl; \*/

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

{

for (int j = 1; j <= k; j++)

{

if (arr\_1[i] == arr\_2[j])

{

res = j \* m - (i-1);

return res;

break;

}

}

}

}

long int perebor(int a, int y, int p)

{

int res;

for (int i = 0; i < (p - 1); i++)

{

long int w = vozvedenie(a, i, p);

if (y == w)

{

res = i;

break;

}

}

return res;

}

int main()

{

long int x, x\_2;

int m, k, a, p, y;

cout << "Enter the a:";

cin >> a;

cout << "Enter the p:";

cin >> p;

cout << "Enter the y:";

cin >> y;

do

{

cout << "Enter the m:";

cin >> m;

cout << "Enter the k:";

cin >> k;

flag = proverka(m, k, p);

if (flag == false)

{

cout << "\nWRONG INPUT \n" << endl;

}

} while (flag == false);

x = shenks(m, k, p, y, a);

long int prov = vozvedenie(a, x, p);

x\_2 = perebor(a, y, p);

cout << "Znachenie stepeni: " << x << endl;

cout << "Znachenie stepeni\_perebor: " << x\_2 << endl;

cout << "Proverka po y: " << prov << endl;

cin.get();

return 0;

}



