#include <iostream>

#include <cmath>

#include <stdio.h>

#include <math.h>

#define PI 3.14159265

#include <conio.h>

#include <windows.h>

using namespace std;

double findDistance(double tx , double ty ){

double distance , targx, targy;

targx=tx;

targy=ty;

distance= sqrt(targx\*targx+targy\*targy);

return distance;

}

double findoneAngle(double tx,double ty){

double m,angleA,targx,targy;

targx=tx;

targy=ty;

m=(targy/targx);

angleA = atan (m) \* 180 / PI;

return angleA;

}

double findanotherAngle(double tx,double ty,double distance){

double m, angleB;

m =(3/distance); // arm of the snowapult is 3 m

angleB = acos(m) \* 180 / PI;

return angleB;

}

double findtimetaken(double tx, double ty,double distance){

double time;

time= distance/3 ;// velocity of the machine being 3 metre per second

return time ;

}

int snowmachine(){

double x,y,angleA,angleB,distance, time;

double ANGLE;

cout<<"\n\t\t\tSnowapult Machine\n\n";

cout<<"\tCAUTION: Once you lock your coordinates the target will be destroyed!\n\n";

cout<<"\tPlease enter the x coordinate of your target: ";

cin>>x;

cout<<"\n\tPlease enter the y coordinate of your target: ";

cin>>y;

distance= findDistance(x,y);

cout<< "\n\tThe distance between the Snowapult and the target("<<x<<","<<y<<")="<<distance<<"m" <<endl;

cout<<"\n\tTHE ANGLE THE SNOWAPULT THROWS THE SNOWBALL COMPRISES OF TWO ANGLES:\n\n";

angleA=findoneAngle(x,y);

cout<<"\n\tThe first angle required for the target ("<<x<<","<<y<<") = "<<angleA<<" degree "<<endl;

angleB=findanotherAngle(x,y,distance);

cout<<"\n\tThe second angle required for the target ("<<x<<","<<y<<")= "<<angleB<< "degree " <<endl;

ANGLE= angleA+ angleB;

cout<< "\n\tThe angle by which the Snowapult throws the snowball at the target ("<<x<<","<<y<<")= "<<ANGLE << "degree"<<endl;

cout<< "\n\tTHE SPEED OF THE SNOWPULT IS 3m/s OR 30feet/s";

time=findtimetaken(x,y,distance);

cout << "\n\t The time taken by Snowapult to hit the target is distance/speed : " <<time << "seconds"<<endl;

return 0;

}

void z() {Sleep(150);}

void dotdotdot(){

char x[] = ". . . . . .#";

for (int i=0;x[i]!='#';i++)

{

cout << x[i];

z();

}

}

int fire()

{

char enter;

cout << "Coordinates locked, press ENTER to fire!"<< endl;

cin.get(enter);

if (cin.get() == '\n') {

cout << "Snowball launched ..."<< endl;

dotdotdot();

cout << "TARGET HIT, Congratulations!"<< endl; }

else

cout << "Error, please re-fire";

return 0;

}

int main()

{

int choice;

do

{

cout << endl;

cout << " 1 - Fire snowapult.\n";

cout << " 2 - Help.\n";

cout << " 3 - Exit.\n";

cout << " Enter your choice and press enter: ";

cin >> choice;

switch (choice)

{

case 1:

snowmachine();

fire();

break;

case 2:

cout << "\nTips: \n\n1) Estimate approximately how far away your target is. \n\n2) x = horizontal and y = vertical. \n\n3) Snowapult will tell you the angle of release, the distance and the travel time of the snowball.\n";

break;

case 3:

cout << "Snowapult powering down.\n";

break;

default:

cout << "Error, Please re-select.\n"

<< "Select again.\n";

break;

}

}while (choice !=3);

return 0;

}