Q1:

#include <iostream>

#include <string>

#include<cmath>

#include<iomanip>

using namespace std;

const double PI=3.142;

int main()

{

//variable declaration

double radius,height;

double volume,cubesidelen;

//prompt the user to enter the required input

cout<<"Enter the radius of the cylinder: ";

cin>>radius;

cout<<"Enter the height of the cylinder: ";

cin>>height;

cout<<fixed<<showpoint<<setprecision(2);

//calculate

volume=PI\*pow(radius,2)\*height;

cubesidelen=pow(volume,1/3.0);

//display the resultant

cout<<"The side of the cube: "<<cubesidelen<<endl;

return 0;

}

Enter the radius of the cylinder: 5

Enter the height of the cylinder: 20

The side of the cube: 11.62

Q2:

#include<iostream>

#include<iomanip>

#include<cmath>

using namespace std;

//define constant

const double PI=3.145;

int main()

{

//declare the required variables

double length;

double radius;

double gap\_tree;

int num;

double space\_single,tot;

//get the required input form the user

cout << "Enter the length of the yard: " << endl;

cin >> length;

cout << "Enter the radius of full grown tree: " << endl;

cin >> radius;

cout << "Enter the gap between trees: " << endl;

cin >> gap\_tree;

//calculate the required

space\_single=2\*radius+gap\_tree;

num = int(length)/space\_single;

tot= (PI\*pow(radius,2.0))\*num;

//display the trees

cout << "Total Number of trees: " << num << endl;

//display the total area covered

cout << "Area covered by trees: " <<fixed<<showpoint<<setprecision(2)<< tot << endl;

return 0;

}

Enter the length of the yard:

100

Enter the radius of full grown tree:

4

Enter the gap between trees:

12

Total Number of trees: 5

Area covered by trees: 251.60

Q3:

#include <iostream>

using namespace std;

int main()

{

//declare variables

int pop\_A;

int pop\_B;

int year = 1;

double growth\_rate\_A;

double growth\_rate\_B;

//Prompt the user to input the population and growth rate of Town A.

cout <<"Enter the population and growth rate of Town A: ";

cin >> pop\_A >> growth\_rate\_A;

cout << endl;

//Prompt the user to input the population and growth rate of Town B.

cout <<"Enter the population and growth rate of Town B: ";

cin >> pop\_B >> growth\_rate\_B;

cout << endl;

if (pop\_A < pop\_B && growth\_rate\_A > growth\_rate\_B) {

do {

(pop\_A = ((growth\_rate\_A /100) \* pop\_A) + pop\_A); //calculates the population growth in one year.

(pop\_B = ((growth\_rate\_B / 100) \* pop\_B) + pop\_B); year++;

} while (pop\_A < pop\_B);

int pop\_Diff = pop\_A - pop\_B;

int pop\_Total = pop\_A + pop\_B;

cout <<"Town A will surpass Town B in population after " << year << " years." << endl;

cout << "The final population of Town A is: " << pop\_A << endl;

cout << "The final population of Town B is: " << pop\_B << endl;

cout << "In year " << year << ", Town A has " << pop\_Diff << " more people than Town B." << endl;

cout << "The total population of both Town A and Town B is " << pop\_Total << endl;

}

else {

cout << "The Values Doesn't Compute.";

}

return 0;

}

Enter the population and growth rate of Town A: 5000

4

Enter the population and growth rate of Town B: 8000

2

Town A will surpass Town B in population after 26 years.

The final population of Town A is: 13308

The final population of Town B is: 13110

In year 26, Town A has 198 more people than Town B.

The total population of both Town A and Town B is 26418

Q4:

#include <iostream>

#include <string>

using namespace std;

void reset(int&, char&, string);

int main() {

int integer;

char choice;

START:

cout << "Please input a positive integer between 1 and 1,000: ";

cin >> integer;

if (!cin)

{// Input validation. Handles input failure.

reset(integer, choice, "\n Check input. Please try again.\n\n");

goto START;

}

else if (integer <= 1 || integer > 1000)

{reset(integer, choice, "\n Integer must be between 1 and 1000. Please try again.\n\n");

goto START;

}

//calculating to see if integer is prime. Notifying user of results.

else if (integer == 2 || integer == 3 || integer == 5 || integer == 7 || integer == 11 || integer == 13 || integer == 17 || integer == 19 || integer == 23 || integer == 29 || integer == 31)

{cout << "\n\n" << integer << " is prime.";

goto END;}

else if((integer % 2 == 0) || (integer % 3 == 0) || (integer % 5 == 0) || (integer % 7 == 0) || (integer % 11 == 0) || (integer % 13 == 0) || (integer % 17 == 0) || (integer % 19 == 0) || (integer % 23 == 0) || (integer % 29 == 0) || (integer % 31 == 0))

{cout << "\n\n" << integer << " is not prime.\n\nIt is divisible by the following prime numbers: \n\n";}

else

{cout << integer << " is prime.\n\n\n";}

//outputting prime numbers that can divide integer.

if (integer % 2 == 0)

{cout << 2<< " ";}

if (integer % 3 == 0)

{cout << 3 << " ";}

if (integer % 5 == 0)

{cout << 5<< " ";}

if (integer % 7 == 0)

{cout << 7 << " ";}

if (integer % 11 == 0)

{cout << 11 << " ";}

if (integer % 13 == 0)

{cout << 13 << " ";}

if (integer % 17 == 0)

{cout << 17 << " ";}

if (integer % 19 == 0)

{cout << 19 << " ";}

if (integer % 23 == 0)

{cout << 23 << " ";}

if (integer % 29 == 0)

{cout << 29 << " ";}

if (integer % 31 == 0)

{cout << 31 << " ";}

END:

cout << "\n\n\n\n";

cout << "\n\nWould you like to try again? ( y | n ): ";

cin >> choice;

if (toupper(choice) == 'Y')

{ // repeat program as necessary

reset(integer, choice,"\n\nRESETTING PROGRAM\n\n");

goto START;

}

return 0;

}

void reset(int &integer,char &choice,string msg)

{ // clears values and notifies user of input validation

cin.clear();

cin.ignore(INT\_MAX, '\n');

integer = 0;

choice = '\0';

cout << msg;

}

Please input a positive integer between 1 and 1,000: 25

25 is not prime.

It is divisible by the following prime numbers:

5

Would you like to try again? ( y | n ): N

Q5:

#include <iostream>

#include <algorithm>

using namespace std;

int main()

{

const int a1 = 5000;

const int a2 = 20000;

const float b1 = 0.125;

const float c1 = 0.1;

const float c2 = 0.14;

const int c3 = 4000;

int price,number;

float a,b,c,d;

cout <<"Please, enter the price of the novel: ";

cin >> price;

cout <<"Enter estimated number of copies: ";

cin >> number;

a=a1+a2;

b=b1\*price\*number;

if (number<=4000) {c=c1\*price\*number;} else {c=c1\*price\*4000+c2\*price\*(number-4000);}

cout <<"First option: " << a<< endl;;

cout <<"Second option: " << b<< endl;;

cout <<"Third option: " << c<< endl;;

d=max(a,b);

cout <<"The best option: " << max(d,c);

return 0;

}

Please, enter the price of the novel: 50

Enter estimated number of copies: 4500

First option: 25000

Second option: 28125

Third option: 23500

The best option: 28125%