**HOMEWORK 5: CS 102 – SECTION 1**

**FALL 2024 (DUE DATE: Thursday, 11 pm, 10/3/2024)**

**Problems 3, 4 and 5 are full program and must be compiled and run**

1. Evaluate each of the following expressions (show computations in details):
2. 4 \* 7 == 74/3

28 = 24

Ans: False

1. 4 + 7 / 2 <= 9 – 15 % 6

4 +3 <= 9-3

7<= 6

Ans: False

1. ‘K’ < ‘k’

75<107

Ans: True

1. 5 / 9 != 0

0 ! = 0

Ans: True

1. 3.9 / 4 – 6 >= 8 – 6.2 \* 1.5

0-6 >= 8-9.3

-6 >= -1.3

Ans: False

1. What is the output of the following program (without running the program in computer, you need to predict by analyzing the program)

*#include <iostream>*

*using namespace std;*

*int main( )*

*{*

*int firstNum = 28;*

*int secondNum = 25;*

*cout << firstNum << " " << secondNum << endl;*

*cout << (firstNum == 38 - 7) << endl;*

*cout << (firstNum = 38 - 7) << endl;*

*cout << (firstNum > secondNum + 10) << endl;*

*cout << (firstNum >= secondNum && secondNum / 4 == 6) <<*

*endl;*

*cout << firstNum << " " << secondNum << endl;*

*return 0;*

*}*

*The output:*

*28 25*

*0*

*31*

*0*

*1*

*31 25*

1. The roots of a quadratic equation ax2 + bx + x = 0, a ≠ 0 are given by the following formula:

X1 =

X2 =

In this formula, the term b2 – 4ac is called the discriminant. If discriminant < 0, the equation has complex roots. If discriminant is equal to 0, then there is a single root, X1 = -b/(2a) and only if discriminant is > 0 then there are two roots.

In your program you get values of a, b and c from user and then compute discriminant first using the formula for discriminant. Then write proper selection statement to check all three conditions and display the roots accordingly.

1. The short term, 0-24 hours, parking fee, F, at an International airport is given by the following formula:

Where int(h + 1) is the integer part of h+1

Write a program that prompts the user to enter the number of hours (h) a car is parked at the airport and outputs the parking fee. Assume one can enter a floating-point number for hours.

1. One way to determine how healthy a person is by measuring the body fat of the person. The formulas to determine the body fat for female and male are as follows:

Body fat formula for women:

A1 = (body weight x 0.732) + 8.987

A2 = wrist measurement (at fullest point) / 3.140

A3 = waist measurement (at navel) x 0.157

A4 = hip measurement (at fullest point) x 0.434

B = A1 + A2 – A3 – A4 + A5

Body fat = body weight – B

Body fat percentage = body fat x 100 / body weight

Body fat formula for men:

A1 = (body weight x 1.082) + 94.42

A2 = wrist measurement x 4.15

B = A1 -A2

Body fat = body weight – B

Body fat percentage = body fat x 100 / body weight

Write a program to calculate and display body fat of a person.

You can declare a character or string variable to check male or female (for character value could be ‘m’ or ‘M’ for male and ‘f’ or ‘F’ for female.