Name:

Course: Introduction to .NET
Title: Tutorial 1
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Q1.1 Open Visual Studio and select a New Console project with: File->New and Select a new a console project with, as shown in Figure 1.14. Next modify the code to give the following:

```
using System;

namespace ConsoleApplication1
{
   class Class1
   {
      static void Main(string[] args)
      {
         System.Console.Writeln("This is my first program");
         System.Console.ReadLine();
      }
   }
}
```

When complete, try and run the program and observe the output.

Q1.2 Modify the code so that it prompts for the user's name, and displays it, with:

```
using System;

namespace ConsoleApplication1
{
   class Class1
   {
      static void Main(string[] args)
      {
         string myname;
         System.Console.WriteLine("What is your name >>");
         myname=System.Console.ReadLine();
         System.Console.WriteLine("Your name is  " + myname);
         System.Console.ReadLine();
      }
   }
}
```

Q1.3 Modify the code to determine the parallel and series resistance of two resistors. The calculation is:

Series: $R_{eq} = R_1 + R_2 \quad \Omega$

Parallel: $R_{eq} = \dfrac{R_1 + R_2}{R_1 \times R_2} \quad \Omega$

An outline of the code is:

```
static void Main(string[] args)
{
   double r1,r2;
   string str;

   System.Console.WriteLine("Enter R1 >>");
   str = System.Console.ReadLine();

   r1=System.Convert.ToDouble(str);

}
```

Run the program, and complete the following table:

R1 (Ω)	R2 (Ω)	Req (Series) Ω	Req (Parallel) (Ω)
100	100		
300	200		
1500	3000		

Q1.4 The power gain in dB is given by the following:

$$Power(dB) = 10\log\left[\frac{P_0}{P_i}\right]$$

where P0 is the power out, and Pi is the input power.

Using the `System.Math.Log10()` function, write a program to determine the power rating in dB's. Test the program by entering the following, and proving the output:

P_i (W)	P_o (W)	P_{gain}(dB)
1	1	0
10	1	-10
1	10	10
1	2	3 dB
2	1	-3 dB

Q1.5 Modify the program developed in Q1.4 so that it calculates the power gain (in dB's) using the following formula:

$$Power(dB) = 20\log\left[\frac{V_0}{V_i}\right]$$

Q1.6 Using the code in Program 1.5, complete the following table:

Run the program, and complete the following table:

R1 (Ω)	R2 (Ω)	Req (Series) Ω	Req (Parallel) (Ω)
100	100		
300	200		
1500	3000		

Q1.7 Using the code in Program 1.6, complete the following table (the first one has already been completed, but check that it is correct):

Real value	Complex value	Magnitude	Angle (°)
3	4	*5*	*71.6*
100	200		
1500	3000		

Q1.8 The following revises Program 1.4. Enter this class, and run the application and check its output:

```
using System;
namespace ConsoleApplication2
{
   public class Cup
   {
      public string Shape;
      public string Colour;
      public string Size;
      public int Transparency;
      public string Handle;
      public void DisplayCup()
      {
         System.Console.WriteLine("Cup is {0}, {1}", Colour, Handle);
      }
   }
   class Class1
   {
      static void Main(string[] args)
      {
         Cup cup = new Cup();
         cup.Colour = "Red";        cup.Handle = "Small";
         cup.DisplayCup();
         cup.Colour = "Green";      cup.Handle = "Small";
         cup.DisplayCup();
         System.Console.ReadLine();
      }
   }
}
```

Q1.9 Modify this class definition so that it defines an Instrument class. The properties are:

Types: "ABC01", "DEF01", and "XYZ11";
VoltageRange: "microVolts", "milliVolts", "Volts", "kilovolts";
PowerRange: "microwatts", "milliWatts", "Watts";

For example a sample run is:

```
The Instrument is ABC01 and its voltage range is microVolts
and the power range is milliWatts.
```

Q1.10 Modify the application class in Q1.9 so that the user enters the type, the voltage range and the power range through the keyboard when prompted, and the application displays the entered values, once they have been loaded into the class.