1-Visual Basic Functions: Visual Basic offers a rich assortment of built-in functions. The numeric and string variables are the most common used variables in programming. Therefore Visual Basic provides the user with many functions to be used with a variable to perform certain operations or type conversion. Detailed description of the function in general will be discussed in the following functions section. The most common functions for (numeric or string) variable **X** are stated in the following table.

Function	**Description**
Numerical Function	
X= RND	Create random number value between 0 and 1
Y=ABS(X)	Absolute of X, |X|
Y=SQR(X)	Square root of X ,
Y=SGN(X)	-(-1 or 0 or 1) for (X<0 or X=0 or X>0)
Y=EXP(X)	
Y=LOG(X)	Natural logarithms,
Y=LOG(X) / LOG(10)	
tan ( )	
Y=INT(X)	Integer of X
Y= FIX(X)	Take the integer part
Function of String Variable	
Y=Len(x)	Number of characters of Variable
Y=LCase (x)	Change to small letters
Y=UCase (x)	Change to capital letters
Y=Left (X,L)	Take L character from left
Y=Right (X,L)	Take L character from right

1-1<u>**Converting Data Types:**</u> Visual Basic provides several conversion functions can used to convert values into a specific data type. The following table describes the convert function.

Function	Description
CDbl	The function CDbl converts, integer, long integer, and single- precision numbers to double-precision numbers. If x is any number, then the value of CDbl(x) is the double-precision number determined by x.
CInt	The function CInt converts long integer, single-precision, and double precision numbers to integer numbers. If x is any number, the value of CInt(x) is the (possibly rounded) integer constant that x determines.0
CLng	The function CLng converts integer, single precision and double-precision numbers to long integer numbers. If x is any number, the value of CLng(x) is the (possibly rounded) long integer that x determines.
CSng	The function CSng converts integer, long integer, and double-precision numbers to single-precision numbers. If x is any number, the value of CSng(x) is the single-precision number that x determines.
CStr	The function CStr converts integer, long integer, single-precision, double-precision, and variant numbers to strings. If x is any number, the value of CStr(x) is the string determined by x. unlike the Str function, CStr does not place a space in front of positive numbers.[variant]
Str	The Str function converts numbers to strings. The value of the function Str(n) is the string consisting of the number n in the form normally displayed by a print statement.
Val	The Val function is used to convert string to double-precision numbers.

<u>**Note:**</u> The following function values for different X are given for comparison.

X=	**10.999**	**- 10.999**	**10.123**	**-10.123**
FIX(X)	**10**	**-10**	**10**	**-10**
INT(X)	**10**	**-11**	**10**	**-11**
CINT(X)	**11**	**-11**	**10**	**-10**

Examples:

A=Lcase ("My Name Is")	→	A= my name is
A=Ucase ("My Name Is")	→	A=MY NAME IS
A=" My Name Is": B=Left (A,7)	→	B=My Name
C=Right(A,7) :	→	C=Name Is

Examples:

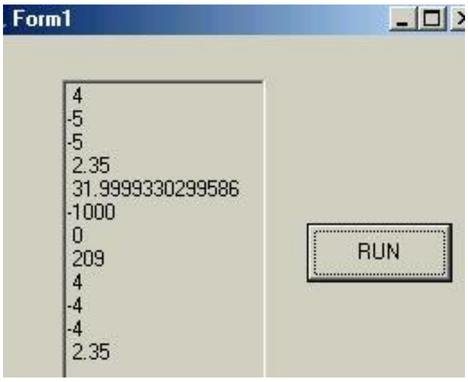
Print INT(4.1)
Print INT(-4.1)
Print INT(-4.8)
Print INT(2.34567*100+0.5)/100

A=3.14159/180: Print SIN (45*A)/COS(60*A)^2/COS(45*A)/SIN(30*A)^3
Print INT (-4E-6/2)*INT(5E8/6E15*1.2E10)

Print SGN (INT(4/3^8/4^3*3^5*2^5))

Print EXP (LOG(27^1/3+2E2^3*4E-4/4^2))

Print FIX (4.1)
Print FIX (-4.1)
Print FIX(-4.8)
Print FIX (2.34567*100+0.5) / 100



```
 4
-5
-5
 2.35
 31.9999330299586
-1000
 0
 209
 4
-4
-4
 2.35
```

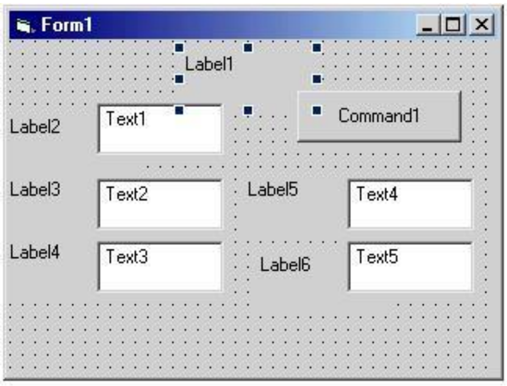
Example (1): Convert the following arithmetic formula to visual Basic language**.**

Arithmetic formula	Visual Basic language
$\sqrt[3]{\frac{e^{5}+\sin 30}{\log(2)-\tan(35)}}$	((exp(5)+sin(30*3.14159/180))/(log(2)/log(10)-tan(35*3.14159/180)) ^(1/3)
$\frac{\pi}{4}\left(\frac{U_{av}}{100}\right)^{2}$	3.14159/4*(Uav /100)^2
$\frac{\pi}{4}\left(\frac{U_{av}}{100}\right)^{2}\frac{1}{\left(1-\left(\frac{Uav}{100}\right)^{5.63}\right)^{0.533}}$	3.14159/4*(Uav/100)^2/(1-(Uav/100)^5.63)^0.533
$\frac{-b+\sqrt{b^{2}-4*a*c}}{2*a}$	(-b+sqr(b^2-4*a*c))/(2*a)

Example (2): Design the program so that the values of a, b, and c (labeled) text boxes and display in separate (labeled) text boxes using quadratic formula as $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$?

Solution:

1- Place six labels, five text boxes, and one command button on the form. The form should appear similar to this:



2- Set the form and object properties:

Object	**Property**	**Setting**
Form1	Name	Form1
	Caption	Form1
Command Button1	Name	Commad1
	Caption	Answer
TextBox1	Name	Text1
	Text	Empty
TextBox2	Name	Text2
	Text	Empty
TextBox3	Name	Text3
	Text	Empty
TextBox4	Name	Text4
	Text	Empty
TextBox5	Name	Text5
	Text	Empty
Label1	Name	Label1
	Caption	روتسدلا
Labe12	Name	Label2
	Caption	a =
Labe13	Name	Label3
	Caption	b =
Labe14	Name	Label4
	Caption	c =
Labe15	Name	Label5
	Caption	X1=
Labe16	Name	Label6
	Caption	X2=

3- Attach this code to the command1 button (Answer)

```
Private Sub Command1_ click ( )

Dim a , b , c , X1 , X2

a=Val  (text1.text)

b=Val(Text2.text)

c=Val(Text3.text)

X1=Cdbl (- b + Sqr (b ^ 2 – 4 * a * c) ) / (2 * a)

X2= Cdbl (- b – Sqr (b ^ 2 – 4 * a * c) ) / ( 2 * a)

Txt4.text = CStr (X1)

Txt5.text = CStr (X2)

End Sub
```

4- **Running the Application:** press F5 or icon ▶