

• • , • •

VISUAL BASIC

3 1.12.2005

2006

22.18

004.43

74

:

. ,, - . , , . - ;

. ,, - . - . , - , -

.

. ,, . .

74

Visual Basic: -

. - : , 2006.

- 164 .

ISBN 966-379-024-5 (.)

ISBN 966-379-052-0

Visual Basic. -

. , , , Visual Basic.

ISBN 966-379-024-5 (.)

ISBN 966-379-052-0

22.18

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© , 2006

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Basic(VB).

VB –

Microsoft Visual

Microsoft Win-

dows,

VB

Microsoft Office

Visual Basic for Applications (VBA) – VB

VB –

Microsoft Visual Basic (VB).

VB,

()

1

(Program) – (), « -

» - .

(Application) – -

, , -

« » « » -

. « » **Windows-**

- , **Windows-** -

(Project) – ,

Windows- . **Visual Basic (VB)** -

, .

, -

() , .

-

, , -

, **VB** , -

, -

, . -

VB- : (-

) , .

,

– .

, ,

, , -

. – ,

, . -

« ».

().

« ».

(Class).

VB

1 (System object) –

VB.

().

() **VB** :

Application – ;

Clipboard – ;

Debug – , Immediate;

Printer – ;

Screen – .

2 (Form) –

3

(Control). VB

(Toolbox).

(Command Button) –

(Label) –

(TextBox) –

(CheckBox) –

(OptionButton) –

(ListBox) –

(ComboBox) –

– Click –

Change –

« »

(Code) –

(Modules)

(Blocs) –

VB

(

(Form module),

Modules

(Standards Module)

(Compiler) –

VB

VB (Developer Studio) -

VB.

2

VB

VB

VB

VB

(_),

REM

, *REM* (

)

2.1

VB,

(),

« »

Sub,

()

(. 2.2.1):

Sub < > ([< > As < >], ...)

End Sub.

(Event procedure)

).

(_).

VB.

Function

Function < > ([< > As < > , ...]) As < >

().

2.2

2.2.1

— , ,
— ,
— ,
(—) , (.2.1).
() — ,

(.2.1).

VB –

1.

String (,)

Variant

Variant

Variant

1 –

VB

Boolean	: <i>true</i> () <i>false</i> ()
Byte	
Integer	()
Long	()
Single	
Double	
Currency	(-)
Date	/
String	
Object	
Variant	

Variant.

Variant.

2.2.2

(Variable) –

VB

Dim.
Explicit,

Option Explicit

VB

Dim,

Dim < _ > [As < _ >]

Dim Grup As String
Dim oценка As Integer

Grup

ocenka

• (General) (Declarations) (, ,);

• (General) (Declarations) *Dim* *Public*.

VB

Dim *Static*:
Static < _ > [**As** < _ >]

2.2.3

VB

, ,
k
k = 1 , *k = 2* - . . .

() .

Dim

() :

Dim < _ > (< 1, .. , k >) **As** < >

(General) (Declarations)

(, ,)

ReDim

VB

Option Base 1

:

Dim ocenky(5) As Integer

Dim M(5,8) s Integer

ocenky

, - ()

2.2.4

```

    ,
    . VB
    ,
    ( )
    ,
    ,
    :
    :
    [ < > . ] < > . < >
    >
    ,
    ( )
    .
    . .
    .
    Font ( . 3.1).
    ,
    ,
    VB
    ,
    .
    ,
    (
    )
    Name.
    ,
    ,
    :
    Form1.Button1.Caption = "
    St1=Form1.Button1.Caption
    Button1.Left = Button1.Left + 200

```

Form1, **Button1**
Str.
200

2.2.5

```
    ,  
    :  
    (  
    -  
    ,  
    Const.  
    -  
    ,  
    .  
    Public.  
    [Public|Private]Const< _ >[As< _ >]=<  
>  
    :  
    Const Grupa As string = " -05-5"
```

2.2.6

```
    - , , -  
    . -  
    : 127,  
3.25, " ".
```

VB

2.3

(Assignment statement)

· :
< > = < >
, (, , ,
) ,
·
·
, ()
·
·
: «+» (), «-»
(), «*» (), «/» (), «^» ().

:
Y=X^2+SIN(x)+SQR(x)

(String),

(), «+» «&».

:
Str=naimfac & “ ”

naimfac () -
 “ ” (« -
 »).
 () -
 , **and** (), **or** ()
not (). **and** **or** - (. .
), **not** - (). -
 . -
 , -
 : *true* *false*.

:
and - *true* ,
true;
or - *true* ,
true;
not - .
 2
 2 -

A	B	A and B	A or B	Not A
true	true	true	true	false
true	false	false	true	false
false	true	false	true	true
false	false	false	false	true

()
).
 : «**=**» (), «**<**» (), «**>**» (),
 «**<**» (), «**>=**» (), «**<=**» (). -
 .
 .
 :
 • ;

- **not;**
- **or;**
- **and.**

Bool=(A<10) and (A>0)

Bool *true* (),
 : 0<A<10 *false* () .

2.4

VB

2.4.1

3 -

3 -

Abs()	
Atn()	rctg x
Cos()	os x
Exp()	, ... e^x
Len()	
Log()	ln x
Sin()	sin x
Tan()	tg x
Sqr()	\sqrt{x}

2.4.2

4 –

Chr(int)	
Lcase(str)	-
Left(str,int)	<i>int</i> <i>str</i>
Len(str)	
Lrim(str)	
Mid(str,intStart, [intLen])	<i>intStart</i> , <i>intLen</i> () -
Right(str,int)	<i>int</i>
Rtrim(str)	
Str(arg)	<i>arg</i>
Ucase(str)	-

5 –

Date	
Time	
Now	

Date Time

Windows

2.4.4

6 –

IsEmpty()	<i>True</i> ,
IsNull()	<i>True</i> , <i>Null</i> (,).
IsNumeric()	<i>True</i> ,

2.4.5 *Format*

VB,

Format (< >, < StrFormat >,

< > - , , -

;

< **StrFormat** > -

«#», «0» «.» .«#» , (

), «0» ,

(),

; «.» -

```

:
Dim Strk As string
Strk=Format (2.5,"###.##")
Strk           " 2.5 "
Strk=Format (2.5,"000.00")
Strk           "002.50"
Strk=Format (2.5,"###.00")
Strk           " 2.50"

```

2.4.6 *MsgBox()* *InputBox()*

```

-           (input box)           (message box).           -
                                     ,           -
                                     .           -
                                     ,           -
(           ,           ,           ,           ,           -
           . .),           ,           -
                                     .           -
           (           ,           )           ,           ,
                                     ,
           .

```

MsgBox():

MsgBox (< > [, [< >] [, < >]])

```

< > -           ,           -
.
< > -           ,           -
.

```

< > - , : -
 . (, -
 . .); , ;
 , , -
 (, **Enter**
). 7.
 7 – **MsgBox**

VbOkOnly	0	OK
VbOkCancel	1	OK, Cancel
VbAbortRetryIgnore	2	Abort, Retry, Ignore
VbYesNoCancel	3	Yes, No, Cancel
VbYesNo	4	Yes, No
VbRetryCancel	5	Retry, Cancel
VbCritical	16	
VbQvestion	32	
VbExclamation	48	
VbInformation	64	
VbSystemModul	4096	SystemModul. - ,
VbDefaultButton1	0	-
VbDefaultButton2	256	
VbDefaultButton3		

. . **MsgBox** – , -

8.

8 –

MsgBox

VbOk	1	OK
VbCancel	2	Cancel
VbAbort	3	Abort
VbRetry	4	Retry
VbIgnore	5	Ignore
VbYes	6	Yes
VbNo	7	No

```

:
S1="                ?"
S2="                "
I=Vbcritical+VbYesNo
If MsgBox(S1, I, S2)=VbNo then exit

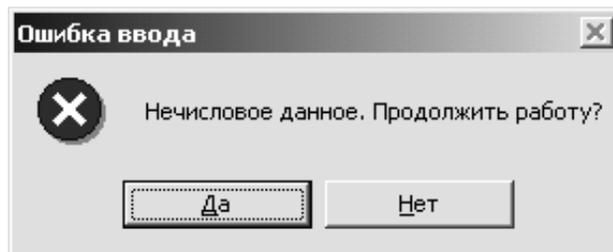
```

1.

No , . . .

exit (

),



1 –

MsgBox

InputBox()

InputBox (< > [, [< >] [, < >]])

< > < >

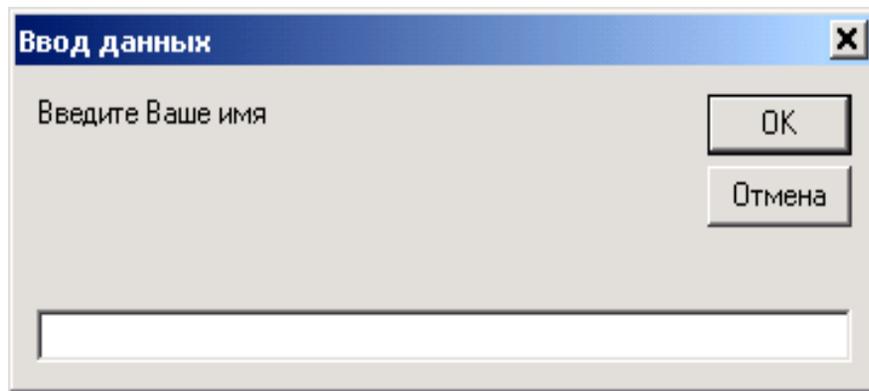
MsgBox().

< > -

Cancel -

Var=Inputbox(" ", " ")

(2).



2 - ,

InputBox()

2.4.7 RGB

Windows . *VB* -

Long **RGB** (- -

). . .

RGB

RGB ,

RGB (<red>, <green>, <blue>)

(*Integer* 0 255) -
 ,
 9 -

RGB.

9 -

	VB			
		Red	Green	Blue
	VB Blanc	0	0	0
	VB Blue	0	0	255
	VB Green	0	255	0
	VB Cyan	0	255	255
	VB Red	255	0	0
	VB Magenta	255	0	255
	VB Yellow	255	255	0
	VB White	255	255	255

2.5

, . . .
 -
 . -
 () .
 -
 , -
 , .

2.5.1 If ... Then

(-
), ,
 (
 : *true* *false*), ().

If < > Then < 1> [Else < 2>]

< > - ; , -
true false. ,

.. *true*, , *then* (..
 < 1>), - ,
else (.. < 2>).

:
If < 1> Then
[1]
Else If < 2> Then
[2]

Else
[3]
End If

```

,
.
,
.
Else If
< 1>.
true,
( ,
, ... < 1>).
. < 1>
( false), < 2> .
true,
( ... < 2>). < 2> -
.
true.
else (
).

```

$$f(x) = \begin{cases} \sin(x), & x < 0, \\ 1 - \cos(x), & 0 \leq x < 1, \\ e^{\sin(x)}, & x \geq 1. \end{cases}$$

```

Function f(x As Single) As Single
    If x < 0 Then
        f = sin(x)
    Else If x < 1 Then
        f = 1 - cos(x)
    Else

```

```
f=exp(sin(x))
End If
End Function
```

2.5.2

Select Case

If ... Then ... Else ...,

```
Select Case <
[ Case < 1>
  [ 1 ]]
[ Case < 2>
  [ 2 ]]
.....
[Case Else
  [ 3 ]]
End Select
```

Case.

)

Case,

Case

```
: < 1> < 2>
Is>=< >.
```

Case

Case Else

Select Case

```

:
:
Function f(x As Single) As Single
  Select Case x
    Case Is<0
      f=sin(x)
    Case Is<1
      f=1-cos(x)
    Case Else
      f=exp(sin(x))
  End Select
End Function

```

2.5.3

- (-
) (-
). . . -
 , -
 .
 :
 • - -
 , ;
 • - , -
 ;
 • - -
 ;
 • - -
 .
 ,
 :

For < >=
 < >
Exit For
 < >
Next [< >]

1, . (-
) < - >, -
Next.

< > - , -
 ,
 . < > - ,

, , .
 , -
 , 1.

.. *For* . -
For ...Next - , *Next* - -

. , -
 ,
 () ,
Exit For. , *If ... Then*

...
 :
 n!. ,
 n! - 1 n.

Function Factorial (n As Integer) As Long
 Dim I As Integer
 Factorial=1

```

    For I=1 To n
        Factorial=Factorial*I
    Next I
End Function

```

(Factorial = 1)

2.5.4

```

Do [ {While | Until} < > ]
    [ ]
Exit Do
    [ ]
Loop

```

():

```

Do
    [ ]
    [ Exit Do ]
    [ ]
Loop [ {While | Until} < > ]

```

Do Loop

(), - .

< true > , VB -
true false. **While** () -

true. **Until,** -
 , *true.* -

Exit DO. **If ... Then.**

:

$$y = \sum_{k=1}^{\infty} \frac{1}{x^k} \quad \varepsilon (\dots \varepsilon) -$$

):

```
Function Sum(x As Single, e As Single) As Single
  Dim a As Single
  Sum=0
  a=1/x
  Do While a>=e
    Sum=Sum+a
    a=a/x
  Loop
End Function
```

2.5.5 While ... Wend

Basic

Visual Basic.

:

While < >
 []
Wend

3

3.1

(. 2.2.4).

Name

Top, Height Width.

: **Left,**

(twip) –

, 1/20

, 1 (point –) 1/72 , 1
1/1440 , .. 0,01736 , 567 = 1 .

Top Left

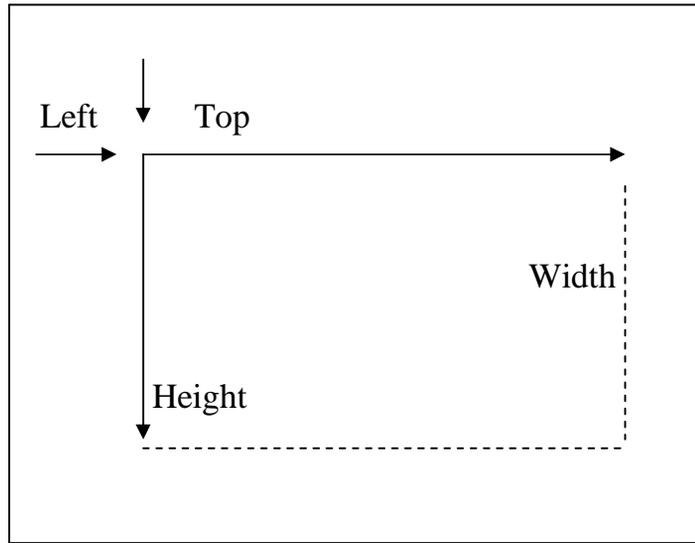
Height Width –

(–

3).

(Y)

(). *Top Left* –



3 – *Left, Top, Height Width*

BackColor (), *ForeColor* ()
FillColor ()
). *Long.*

shapes –

RGB.

RGB

(. 2.4.7).

Font.

Font

(*Objekt*).

VB

Font,

10.

Font.Name	
Font.Size	
Font.Bold	
Font.Italic	
Font.Underline	
Font.StrikeThrough	
Font.Weight	

. . , , *TextBox1*
 , :
 Form1.TextBox1.Font.Bold=true

Appearances,
 ().
BorderStyle -
 -
 .
Caption -
 (, -
 . .).
 , -
 , *Text* -
 .
 . , -
Text, , - *Caption.*

ToopTilText

, . . .

,

ToopTil

.

MousePointer.

Enabled Visible.

Enabled = True,

. *Enabled = False*

,

.

Visible = True,

,

(Visible = False)

(.)

(), -

(),

.

,

-

, *False*

Enabled,

Visible,

,

-

.

Tab (Shift+Tab)

,

-

Tab

Shift+Tab

Ta-

bIndex.

-

(RunTime).

Windows

« ».

(),

Shift+Tab.

TabIndex,

Tab.

TabIndex = 0

Tab

TabIndex (Shift+Tab –

Tab ()

TabIndex.

VB

TabIndex

:

,

.

TabIndex

VB

Tag

Tag

3.2

(Events)

()

: **Click** ()

DoubleClick ().

Click.

(Command Button)

KeyPress,

VB

: **LostFocus** () **GotFocus** ().

LostFocus

- GotFocus

3.3

[< >.]< - - >.< >[< >]

Move,

Top Left

: Show Hide

Visible *true false*

```

        (
    .
    ,
    -
VB
    :
    - Printer;
    - ( Form);
    - PictureBox. ( . 5.11).

```

4.1

```

    ,
    ,
    3.
    ,
    .
    ,
    .
    Height Width
    , . . . (
    ,
    -
    ).

```

```

-
:
,
-
,
. . .
:

```

```

ScaleLeft - ( );
ScaleTop - ( );
ScaleWidth - ;

```

ScaleHeight -

: (0,0).

(. 3.1).

ScaleMode.

ScaleMode 3 – Oixel,

, . . . ,

(

CurentX CurentY,

BorderStyle

0 (vbBSNone) –

;

1 (vbFixedSingle) –

;

2 (vbSizable) –

;

3 (vbFixedDialog) –

;

CorelBox (

); **MaxButton** (

MinButton (

true

()

WindowState :

0 (Normal) – ;

1 (Minimized) – ;

2 (Maximized) – (. . .)).

Icon . ,

.

4.2

Form .

Load , **Unload** –

. **Load**

Activate .

, , -

Resize .

, . . . -

4.3

, , -

(**Printer**, **Form** **PictureBox**), , -

(,).

Show **Hide**, -

, ,

,

Visible, .

```

VB.
). Qbasic, VB,
: VB
!
1 (CLS)
PictureBox)
2
Print [ Spc(n) | Tab(n) ] < _ >
< _ > -
(print zona) 14
Print
Print Spc(n) Tab(n)
. Spc(n)
n.

```

Tab(n) , n -
 ,
 3

Pset [step] (X,Y) [, < >]

X, Y - ;

step , () , -

X Y . **step** , **X Y** - ;

< > - **RGB**; -
RGB

(9); ,

(CoreColor).

4 ,

Line [[step] (X1,Y1) - [step] (X2,Y2) [, < >] [[,B[F]]]

(X1,Y1) - (-
);

(X2,Y2) - ;

step , ... -
 ;

< > - **RGB** (**CoreColor**).
RGB -

(9.);

- , -

(X1,Y1) - **(X2,Y2)**;

BF- , -

5

```

Circle[step](X,Y),< >[,< >][,< >][,< >]
[,< >] ]
(X,Y) ;
step - , (X,Y) - -
;
< >- ;
< >- RGB, -
(CoreColor);
< >,< >- .
-2*PI +2*PI, PI=3,14... ; - = 0, = 2*PI;
< >- -
( «Y» « »);
1 ( ).

```

Sub Prim

If ScaleWidth<ScaleHeight Then

R=ScaleWidth/4

Else

R=ScaleHeight/4

End If

Circle (ScaleWidth/2,ScaleHeight/2),R,vbRed

Line (ScaleWidth/2,0) – (ScaleWidth/2,ScaleHeight),vbBlue

Line (0,ScaleWidth/2) – (ScaleWidth,ScaleHeight/2),vbBlue

End Sub

()

Windows-

,

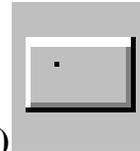
:

,

.

5.1

(CommandButton)



,

VB.

Windows,

Captions,

“ ” (&),

Alt

(

). **Windows** ,

Picture, DisabledPicture DownPicture

Style *1 – Graphical.*

– *Enabled Visible* –

TabIndex -

Tab, TabStop -

Tab (False).

Default , -

(*True).* *Enter* -

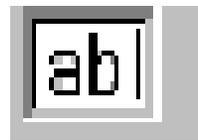
Click -

Cancel Esc Click -

– *Click.*

5.2

(TextBox)



() ,

```

        - Text.
    (
        Caption).
    .
    .
    .
        Text
    .
    . . .
    . . . ,
    ,
    ,
    (
        ).
    Font
    ,
    (
    3.3,
    ).

```

```

SelStart (
    ) SelLength (
    ).
    ,
    FLD
    :

```

```

Private Sub FLD_GotFocus()
    FLD.Selstart=0
    FLD.SelLength=Len(FLD.Text)
End Sub

```

```

        SelText
    .
    .
    MultiLine
    ,
    .
    ScrollBars,
    .
    Locked,
    false,
    .

```


Set-

Focus,

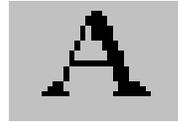
, ,

,

.

5.3

(Label)



,

.

—

,

.

– *Caption* (*Text-*

).

,

.

,

.

BorderStyle

AutoSize=True

, *WordWrap=True*

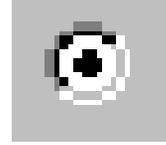
Font

,

(. .3.3).

5.4

(OptionButton)



Frame.

Value,

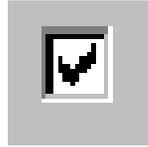
True () *False* ().

Caption

– *Click.*

5.5

(CheckBox)



Value,

.
 .
 : - , -
 ,
 ,
 . -
 , ,
 ,
 .
 . *Value* ,
 - « » .

-Value,

:
 0 - ;
 1 - ;
 2 - , ().
Caption , , -
 , .

- Click.

, . .
 .
 (, -
Click),
Value.

5.6 (ListBox)



t. — *ListIndex.*

List().

List out.

List() ListIndex:

Str=LstBox.List(LstBox.ListIndex)

, :

Str=LstBox.Text

ListIndex –
Text –
Sorted
 (). (. *true*),

Sorted

ItemData()

- (, . .),
 ().

NewIndex.

52431:

LstPersonal.AddItem “ ”
 LstPersonal.ItemData(LstPersonal.NewIndex)=52431

MultiSelect

():

0 – (

);

1 – ;

;

2 – ;

Shift Ctrl.

Text

Selected()

, (True) (False).

```

:
If LstPersonal.Selected(2) Then
    Str= LstPersonal.List(2)
End If

```

```

    Selected() -

```

```

,
    Columns -

```

```

.
    - Click, -

```

```

(
    ).

```

```

    DbdClick, -

```

```

.
    -

```

```

    Windows.

```

```

    AddItem, - RemoveItem. -

```

```

.
    -

```

```

.
    , -

```

```

:
Private Sub Form_Load
    LstBox.AddItem " -05-1"
    LstBox.AddItem " -05-2"
    LstBox.AddItem " -05-3"
End Sub

```

```

:
```

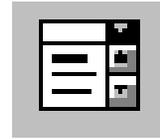
LstBox.RemoveItem 2

Clear.

:
LstBox.Clear

5.7

(ComboBox)



,
.
.
.
.
.

TextBox

LstBox. (— — *MultiLine*).
Style,

:
0 — ().
,
.
,
.
.
;
1 — .
,
;

2 -

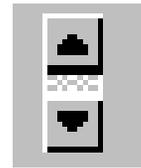
.
.
:
, **Style=2**
.

Click - **Change -**
. , **Change**
2, -

, , .

5.8

(Scrollbar)



() .
- , ... -

. -
, (-
).

(Horizontal),

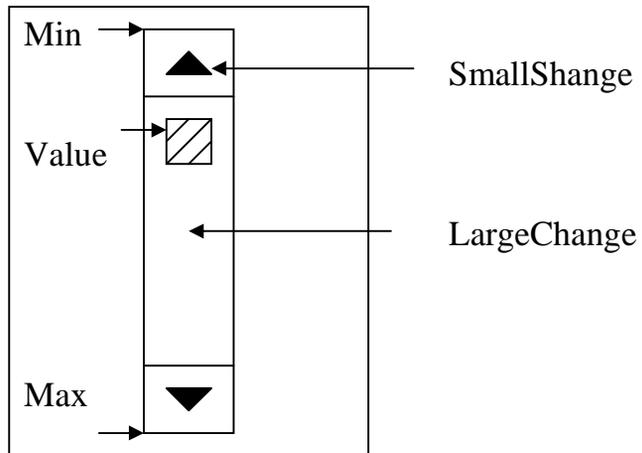
(Vertical)

(
) -

- . -
(-
) .

Min Max.
 Value.
 Value
 Value,
 Min Max.

Value
 SmallChange.
 Value
 LargeChange() (4).



4 -

()

Value
 Value

Change

Value

- Change,

Value.

Value

Change

Scroll,

Change.

5.9

(Time)



```

        Interval,
        , . .
        1000.
        ,
        65 535 ( . . 65,5
    ).
        Enabled      False.

```

```

        - Timer,
        .
        Timer
        Interval,
        , Visual Basic
        :
        ,
        Label      (      Name)

```

```

Labbell
Timer1,      Interval,      1000 (1 -
    ).      Timer1:

```

```

Private Sub Timer1_Timer()
    Label1.Caption=Time$
End Sub

```

```

        Timer$
        .
        Windows
        .
        Labbell
        ,
        ,
        .
        Timer
        .

```

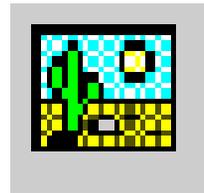

VB

Name)

Caption,

5.11

(PictureBox)



4.3).

Picture

(.wmf)*

(.bmp),*

(.emf),*

(.ico),*

gif – jpeg-

Picture

LoadPicture:

Picture1.Picture=LoadPicture("C:\Windows\Autos.bmp")

SavePicture:

SavePicture Picture1.Picture,"BUILD.BMP"

AutoSize

true,

LoadPicture

Picture1.Picture=LoadPicture()

Image

Picture.

Click.

PictureBox

(.4.3):

PicDisplay.Print "Hell World"

PicDisplay.Line (0,0) – (100,500), VBRed

PicDisplay.Circle (300,300),250, VBBlue

5.12

(Image)



PictureBox,

:

PictureBox.

– *Picture*.

,
PictureBox).

(

Pic-

Stretch

true,

false (),

5.13

(Menu)

Windows

. ()
 (), -
 , . -
 , ,
 ,
 - .
 , ,
 , -
 (6) . (-
) , -
 . . . , . :
 , :
 . , -
 . -
 .
 VB ,
 , -
 . -
 -
 (5).
(Menu Editor) - , -
 . -
 , : -
 (),
 , . -
 (, -
 . .) , -
 , -
 , Ctrl+E,

Tools⇒Menu Editor...

Редактор Меню

Заголовок: [] OK

Имя: [] Отмена

Индекс: [] Ярлык: (None)

Помощь ID: 0 Договорная Позиция: 0 - None

Проверка Включить Видимость Список Окон

← → ↑ ↓ Следующий Вставить Удалить

5 –

() () .

Caption () ,

. **VB** -

“ ” ()
). “ ” – ,

, “ ”
 . “
 ”
 (&). ,
Shortcut (),
 .
Ctrl Alt
 , *Shortcut.*
 “ ”
 “ ”
 ,
 .
 :
 • , — ;
 • “ ”,
 ;
 • ,
 ;
 • ,
Checked
Name ()
Enabled ()
 , (,
). ,
 .

Windows

:

Visible ()

Checked ()

Next ()

Insert ()

Delete ()

(5).

Click –

(. .) -

. *VB*

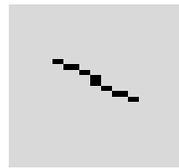
, , , -
.

Code

, , -

5.14

(Line)



(. 5.15)

BorderColor –

RGB,

;

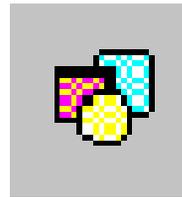
BorderStyle – , - ;

BorderWidth – () (-) ;

Visible – -

5.15

(Shape)



BackColor – **RGB**;

BackStyle – 0 – (. .), 1 – - ;

BorderColor – **RGB**;

BorderStyle – ;

BorderWidth – ;

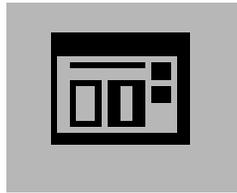
FillColor – () **RGB**;

FillStyle – () ;

Shape -

- 0 – *Rectangle* – ;
- 1 – *Square* - ;
- 2 – *Oval* – ;
- 3 – *Circle* – ;
- 4 – *RoundedRectangle* – ;
- 5 – *RoundedSquare* – .

5.16



(Common Dialog Box)

dows,

Win-

Common Dialog Box

- ;
- ;
- ;
- ;
- ;
- ;
- ;

Common Dialog Box

, , ,
, *Project⇒Components.*

Components

Microsoft Common Dialog Control 6.0 *OK.* ,
, Microsoft

Calendar,

(

Timer).

Common Dialog Box –

,
:

, , ,

–
,

, , ,

, , ,

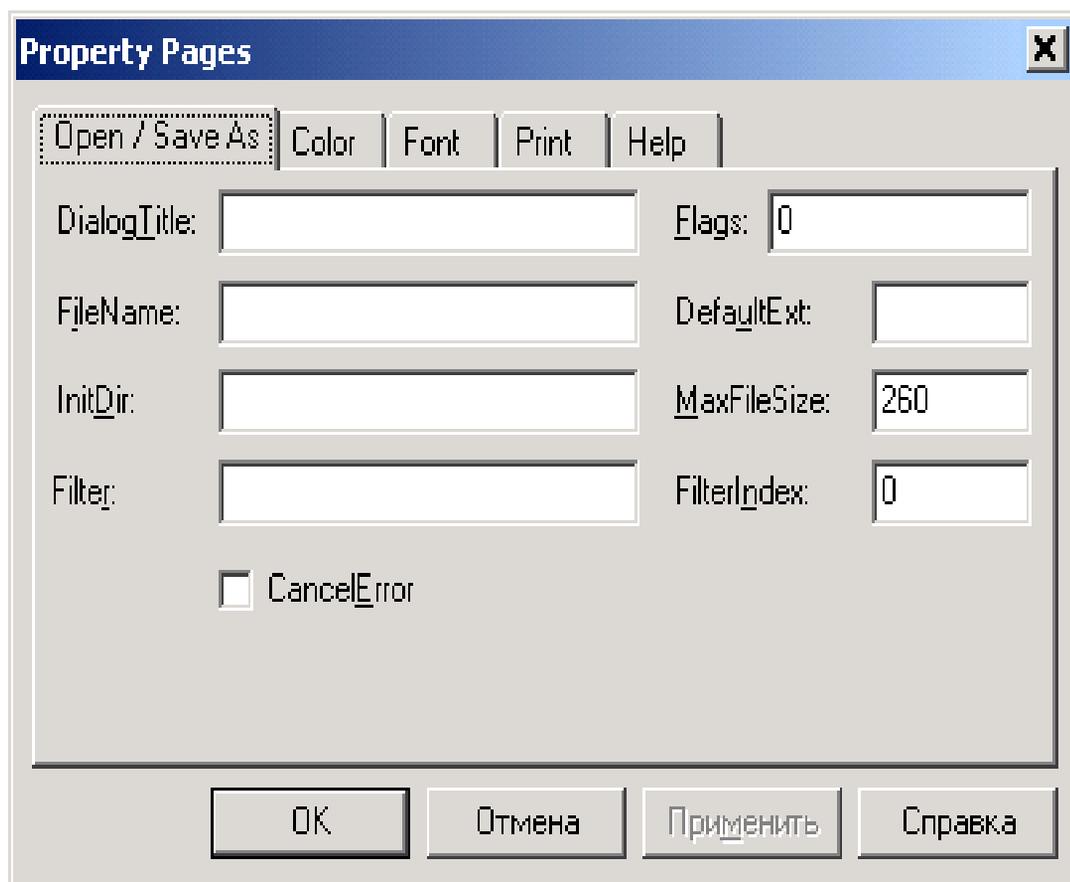
,
,

Common Dialog Box

, , ,

DialogTitle –

Flags –



6 –

Properties Pages

```

        - RGB.
        Flags
    • 1 - Color
        ;
    • 2 - Color
        ;
    • 4 - Color
        (. ).
        Color
        RGB.
        :
        -
        Batton1 db Common Dialog Box
        ,
        ,
        Form2 (
        ForeColor).

```

```

Private Sub Batton1_Click()
    cdb.DidlogTitle="
    cdb.ShowColor
    Form2.ForeColor=cdb.Color
EndSub

```

```

        - .
        Flags
    • 1 - ;

```

- 256 – “ ”;

), *FontSize* (), *FontBold* (), *FontItalic* (), *FontUnderLine* (), *Color* ().

:

Batton2 *db* *Common Dialog Box*

Form2

```
Private Sub Batton2_Click()
    cdb.DialogTitle=" "
    cdb.Flags=1+256
    cdb.ShowFont
    Form2.Font.Name=cdb.FontName
    Form2.Font.Size=cdb.FontSize
    Form2.Font.Bold=cdb.FontBold
    Form2.Font.Italic=cdb.FontItalic
    Form2.Font.UnderLine=cdb.FontUnderLine
    Form2.ForeColor=cdb.Color
EndSub
```

Flags

- 1 – “ ”;

• 256 – “ ”

;

cdlOFNFileMustExist –

InitDir (

– /) **FileName** ().

:

Batton3

db

Common Dialog Box

,

().

,

Open,

Private Sub Batton3_Click()

Dim Strk as String

cdb.DidlogTitle= “ ”

cdb.Flags=cdlOFNFileMustExist

cdb.ShowOpen

Strk =cdb.InitDir & cdb.FileName

Open Strk for Input As #1

...

EndSub

,

:

ShowColor – ;

ShowFont – ;

SowHelp – ;

SowOpen – ;

SowPrinter – ;

SowSave – .

5.17

VB, () *VB*

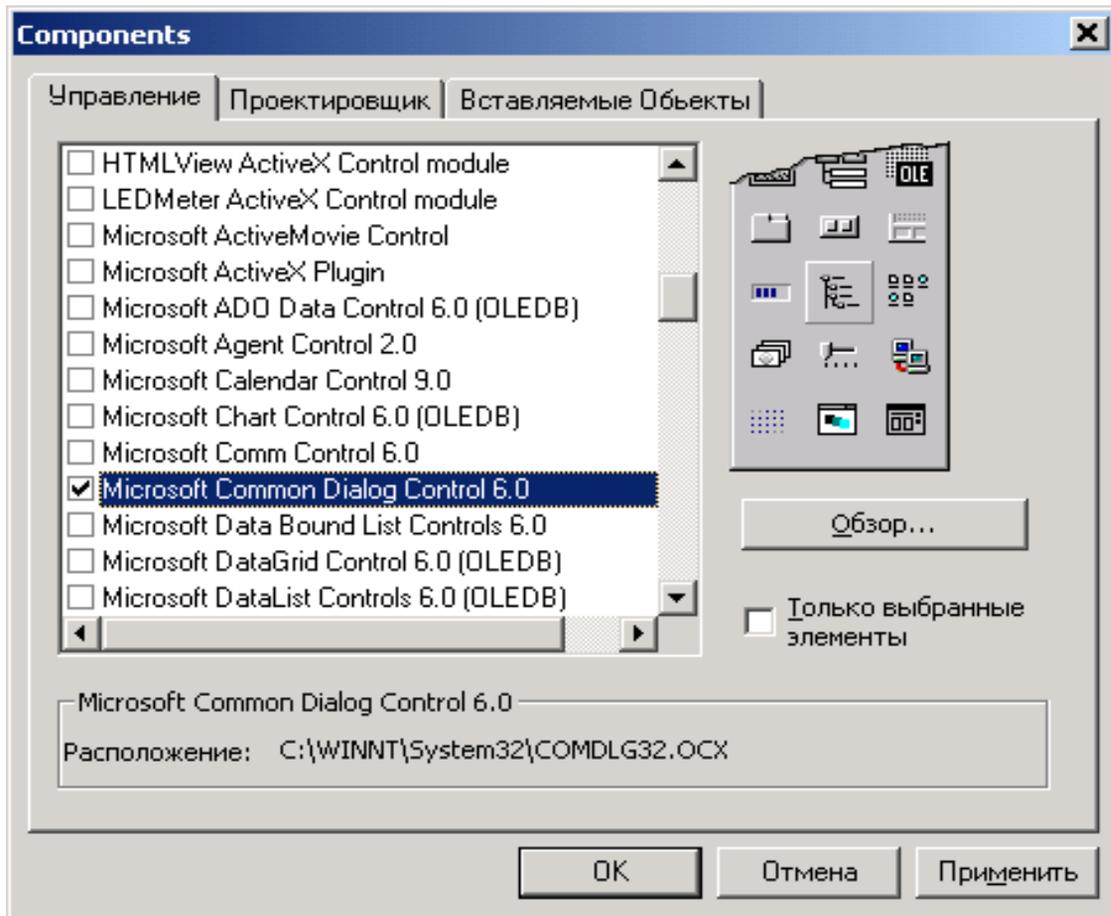
Common Dialog Box.

Components (

7).

(...)

Project⇒Components (⇒)



7 –

Components

Components

Control (-

).

()

(...),

OK.

(Custom Controls).

6

— (,).

V

().

(),

(/).

/

6.1

. V

Open,

-

Open < > For < > AS # < >

: < > -

,

:

, (, -
"/") ; -

, , ;

< > -

:

Input -

Output-

Append -

(. . -

),

Random -

< > -

(/) -

;

;

Append,

Output Random V

Output

Append

Append.

Output:

FreeFile,

6.2

Append Output,
Write,

Write #<

>, <

>

6.3

Input,

(

)

()

Input.

. () :
Input #< >, < >
 ,
 .
 . . . ,
 .
 (,)
 , .
 , ,
 . **EOF().**
(End Of File).
 < >,
True,
 (),
False .

6.4

Close, - :
Close #< >
 :
 1 ,
FIO (), God ()
Adr (). , **Kol,** .

,

Common Dialog Box (. 5.16).

-

cdb.

```
Sub SaveInFile()  
  Dim Strk As String  
  Dim FilNum As Integer  
  db.DialogTitle = "  
  cdb.ShowSave  
  Strk = cdb.InitDir & cdbFileName  
  FilNum = FreeFile  
  Open Strk For Append As FilNum  
    For i=1 To Kol  
      Write #FilNum, FIO(i), God(i), Adr(i)  
    Next  
  Close FilNum  
End Sub
```

2

,

(General) (Declarations)

(. .

)

-

20

-

CurCount .

```
Sub LoadFile()  
  Dim Strk As String  
  Dim FilNum As Integer  
  Dim CurCount as Integer  
  db.DialogTitle = "  
  cdb.ShowOpen  
  Strk = cdb.InitDir & cdbFileName  
  FilNum = FreeFile
```

```

Open Strk For Output As FilNum
CurCount = 1
Kol = 0
Do Until EOF(FilNum)
    Kol = Kol + 1
    If Kol >= CurCount then
        CurCount = CurCount + 20
        Redim FIO(CurCount)
        Redim God(CurCount)
        Redim ADR(CurCount)
    End If
    Input #FilNum, FIO(Kol), God(Kol), ADR(Kol)
Loop
Close FilNum
End Sub

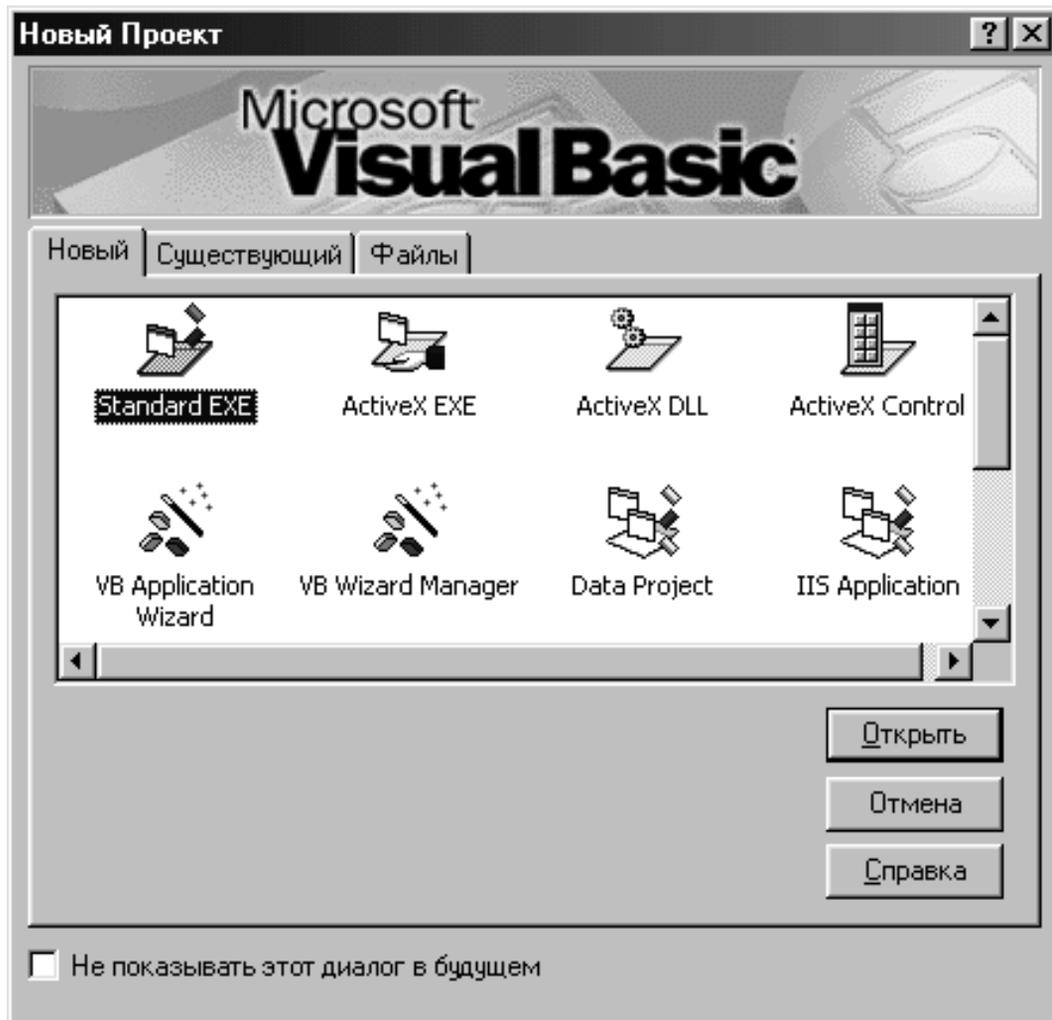
```

7

VISUAL BASIC

Visual Basic, *Windows-*, *:*
 • ()
 ;
 • ;
 • , *Far*
Manager;
 • (*Visual Basic* -
**.vbp*),
Visual Basic,
 (8). -
 .

(*VB Application Wisard*),



8—

Visual Basic

Program) –

(*Skeleton*

),

« »,

,

.

,

,

,

.

« »,

Visual Basic

Standard EXE.

Visual Basic.

,

,

File (), Save (), Save As (...)

Open ()

.

8

VISUAL BASIC

(Developer Studio) –

9.

Visual Basic

Visual Basic

,

.

, Visual Basic

-

,

View ⇒ Toolbars (⇒

-

).

-

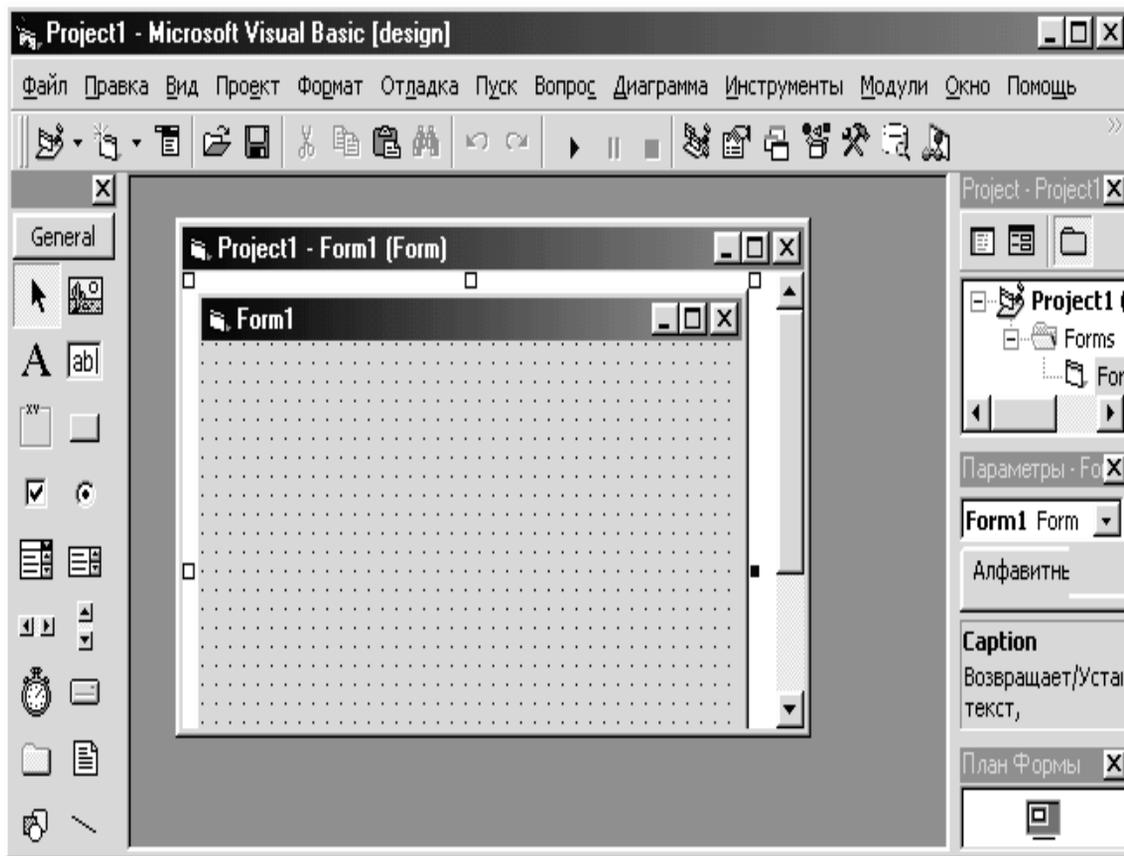
.

,

-

View ()

.



9 - *Visual Basic*

(*Form*) – , -
 (10).

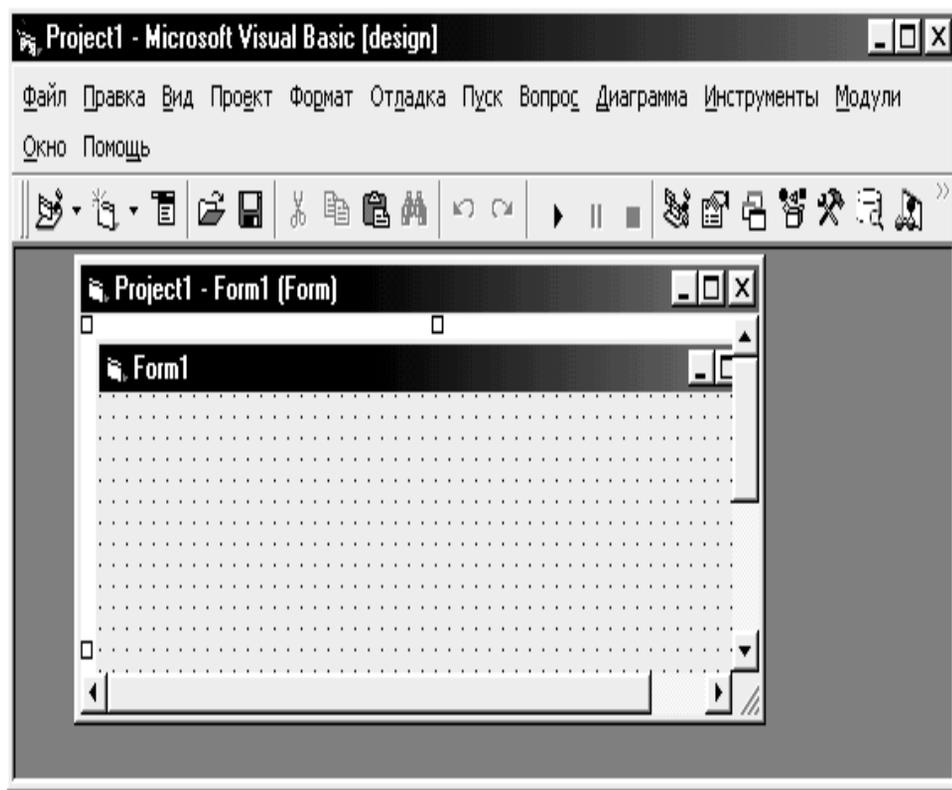
Visual Basic

().

, . . . *Visual Basic* -

MDI (Multiple-Document Interface) – *Windows*

Project ⇒ *Add Form* (⇒).



3 –

(Toolbox)

(Control):

, , . (11).

, () .

Toolbox,

(

)

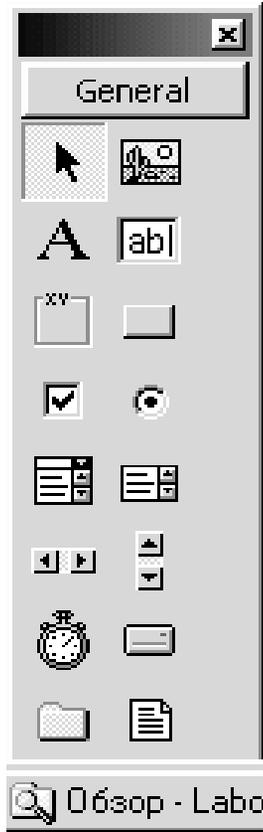
:

Toolbox

()

Project ⇒

Component.



11 -

(Custom Controls).

(Properties)

(12).

F4,

View ⇒ **Properties Window**

(⇒).

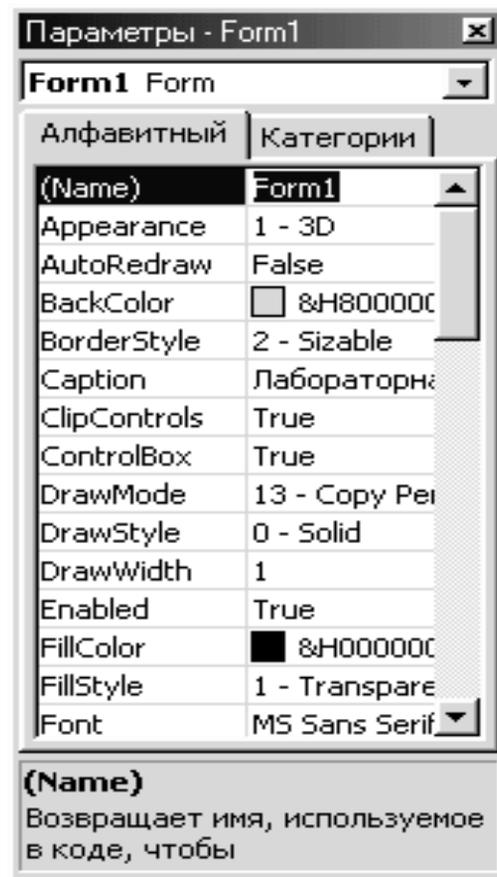
Properties (-

)

,

-

-



5 -

Properties

(*Alphabeta* ())

(, *Name* -

).

Categorized () -

Properties

Explorer (. .).

:

• , *(Caption);*

• ,

(Appearance).

;

• ,

(BackColor),

(ForeColor) -

(FillColor);

• ,

: *(Top Left),*

(Height) (Width);

• -

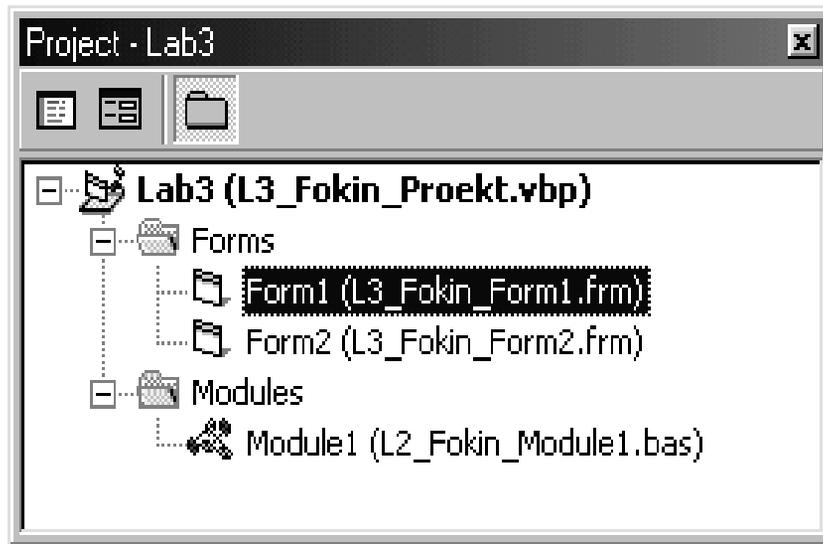
(. . *Run Time*).

Visual Basic -

(Twip) – 1/440 1/20 .

(Project Explorer Project). -

(13).



13 –

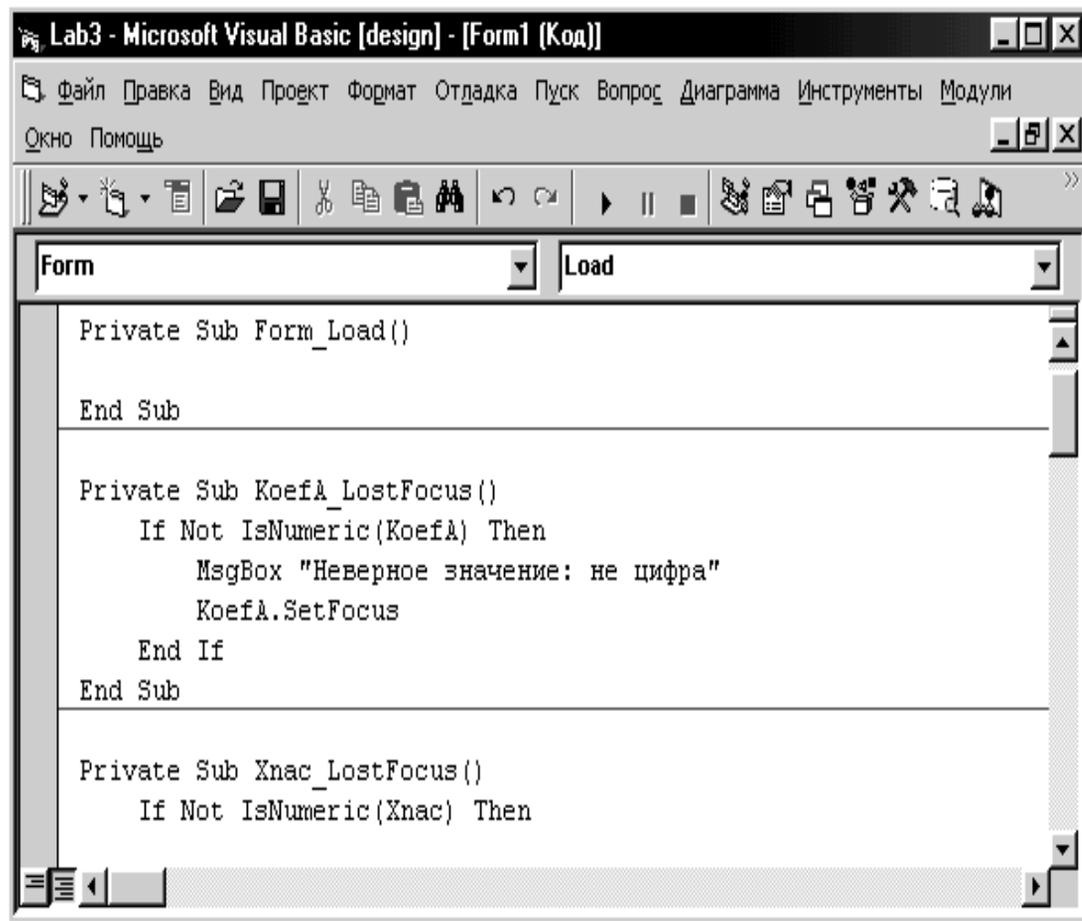
Visual Basic

. , ,
 . ()
 , , -
 :
 , ..
 .
 ,
 .
 VB – :
 , -
 .
 (,
 . .), *File*
 ⇒ *Save* (⇒) *File* ⇒ *Save As ...* (⇒ -
 ...) ().
 () *File* ⇒ *Save Project*

	FRM
	CLS
Basic	BAS
	RES
OLE Custom Control	OCX
Visual Basic	VBP
	VBG
Active X	CTL
Active X	VBD
Crystal Report	RPT
MS Access	MDB
	INI
	BMP
Windows	HLP
(Rich text format)	RTF
	ICO
	DLL

*F7,**View ⇒ Code (⇒)*

(14).



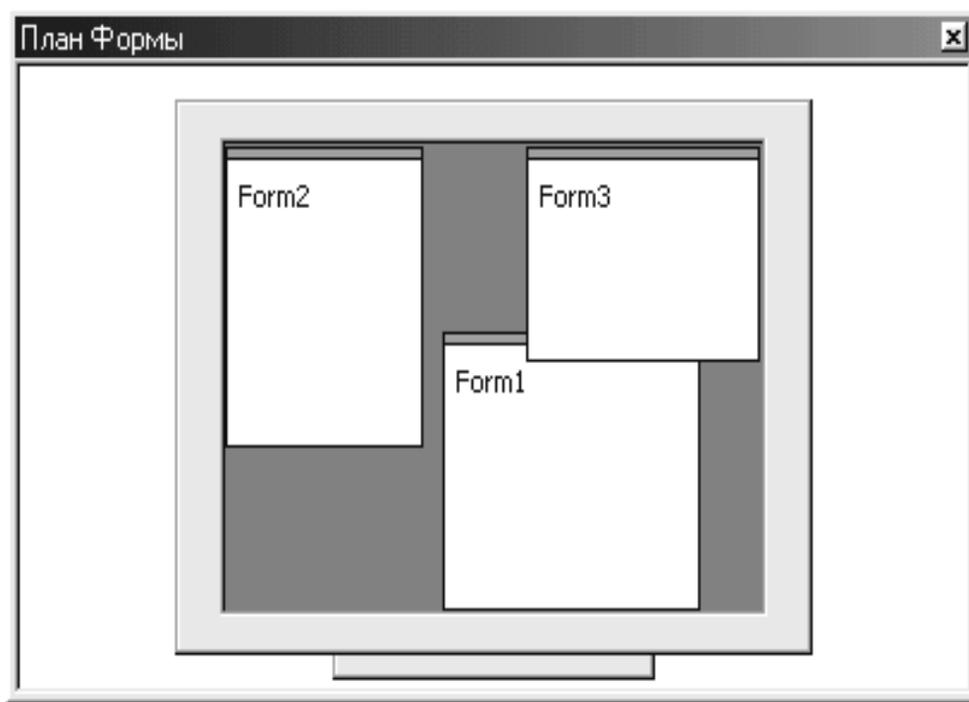
7 –

(Objekt - -

)
(Procedure -) –
 ()

()

,
 ()
 .
Sub
 ,
General. Object
Procedure
 ,
 ,
 ,
 ,
Project ⇒ Add Module (⇒
).
 ,
Windows.
Form Layout ()
 (15).



15 -

Form.

Form Layout,

9

Start ()

(

),

F5

Run (),

Run.

(

),

Windows,

-

Stop ()

« » (, « »)

Ctrl + Break.

() *Run ⇒ End* (⇒)

Run ⇒ Restart (⇒).

Visual Basic

Visual Basic,

*File ⇒ Make ***.exe* (⇒ ***.).

10

1

(

).

2

3

4

:

L< >_< >_< > ,

< > - ;

< > - ;

< > - .

:
L4_ _Forma2
L4_ _Project
L3_ _Module2

5 (*Caption*) -
. -
, .4, 5, -
!!!

6
Visual Basic. -

7 -
. -
. . -

8
, , -

9 -
.

!!!

, .

Visual Basic.

Visual Basic , -
 ; ; .
 : Visual Basic
 ,
 .

11.1

() (Properties),
 .
 (12).
 , -
 .
 Visual Basic , -
 , -
 .
 (13).
 , 12
 BorderStile , .
 (Label).

12.

Name	.
Left, Top	(, . .) -
Height, Width	
BackColor	
CoreColor	
Font	, , -
BorderStyle	
Caption	, (, . .) -
ToolTipText	, -
MousePoiuter	
TabIndex	.
Enabled	
Visible	()

Picture	, -
ScaleHeight, ScaleWidth	()

(Command Button) -

Clik, -

12, -

(14).

(CheckBox)

: / (/ , /

. .).

14 -

Default	Enter - Clik ,
Cancel	Esc - Clik ,

(TextBox) -

- **Change** -

LostFocus GotFocus

12,

Text, **Caption** -

- **Clik** ().

12, ,

Value, :

- ;
- ;

(Option Button)

– Klik (

). – Value,

12.

11.2

1

2

Visual Basic.

3

8)

Standart Exe.

Lab1.

(Project)

View ⇒ Properties

Window (⇒)

Properties ()

Name

Lab1.

4

View, /

Visual Basic:

5

Name

Form1.

Caption

« 1. < > < -

>».

6

Run-Time.

F5.

7

ToolBox,

(

CommandButton)

«EXIT» (Name)

« » (Caption).

Run-Time

```
8           Hello           «           ».  
9  
?  
10          EXIT  
           Click           EXIT (  
           Visual Basic           ):  
  
Private Sub EXIT_Click()  
    End  
End Sub  
  
11         Click           Hello           :  
  
Private Sub Hello_Click()  
    Print "           !           "  
End Sub  
  
12          (F5).  
           Hello EXIT?  
  
           Hello.  
  
13          Click           Hello,  
:  
  
Private Sub Hello_Click()  
    Dim i as integer  
    i = InputBox("           ")  
    Font.Size = i  
    Print "           !           "  
End Sub
```



```

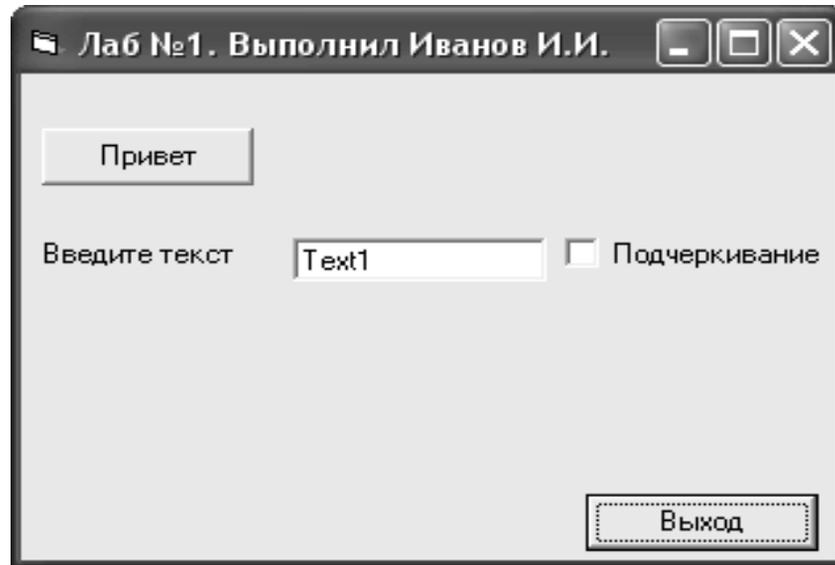
CurrentY=(ScaleHeight-TextHeight(Str))/2
CurrentX=(ScaleWidth-TextWidth(Str))/2
Print Str
End Sub

```

```

17          Text1      TextBox ( -
)
Label1    Label (      )      (      Caption) “
”,
16.

```



16 – Form1

```

18          Hello_Click() ,
Text1
(      ) – &.
«      »

```

```

Private Sub Hello_Click()
Dim i As Integer
Dim str As String
Cls
str="      !      " & _Text1.Text
i = InputBox("      ")
Font.Size = i

```

```

Font.Underline = Check1.Value
CurrentY=(ScaleHeight-TextHeight(str))/2
CurrentX=(ScaleWidth-TextWidth(str))/2
Print str
End Sub

```

```

19      Project => Add Form (      =>      ) -
      Form2,      EXIT      « -
      »      Click      -
      :

```

```

Private Sub Exit_Click()
    Visible = False
End Sub

```

```

      Visible (      )
False (      )      (      ).
20      Form1      F2      « -
      »      Click:

```

```

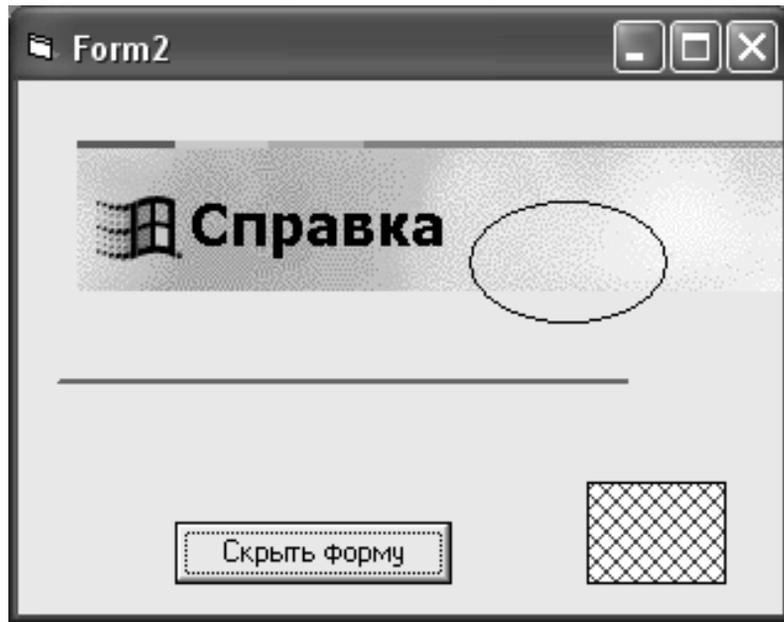
Private Sub F2_Click()
    Form2.Visible = True
End Sub

```

```

Form2 (      ).      ,
      Run-Time      /      .
21      Image, Line, Shape, Label,      -
      Form2.      ,      -
      . . (      17).

```



17 -

Form2

22

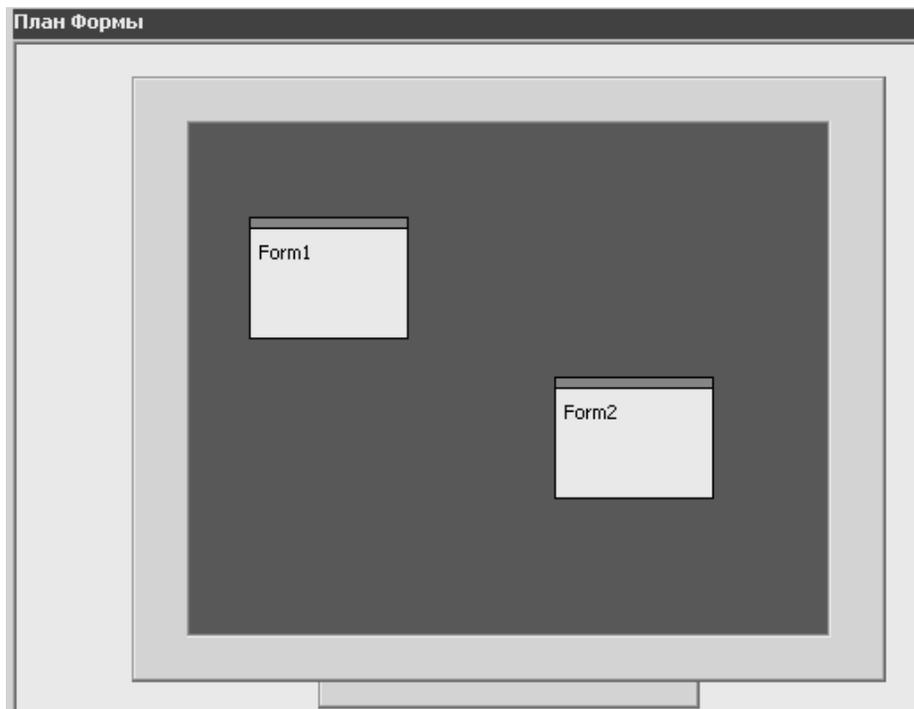
Form Layout (

),

Form1 Form2

,

(18).



18 -

23

4.

1: L1_< >_Form1
 2: L1_< >_Form2
 : L1_< >_Project

24

12

2

Visual Basic;

$$y=f(x)=\begin{cases} f_1(x), & x\leq 0, \\ f_2(x), & 0<x\leq a, \\ f_3(x), & x>a. \end{cases}$$

$f_1(x), f_2(x) f_3(x)$

12.1

$$y = f(x) = \begin{cases} \sin(x^2 + ax), & x \leq 0 \\ 1 - \frac{1 + \sqrt{(x^2 + ax)}}{e^{\sin(x)}(1+x)}, & 0 < x \leq a \\ \frac{\cos(x^2 - a^2)}{\sqrt{1 - \sin(a-x)}} - \frac{1 - \sin(a-x)}{e^{\sin(x)}}, & x > a \end{cases}$$

1

Visual Basic.

Lab2.

2

Form1,

19.

Лабораторная работа №2 Выполнил Иванов И.И.

*Вычисление значения функции.
Лабораторная работа №2*

Введите значение A

Введите значение X

Ответ

Расчет Выход

19 -

Form1

```

)
    (TextBox):
    A - ;
    - ;
    Y - .
        Text
- ;
) (Label) ;
) ;
    Command1 ;
    Command2 .
3 Y :
    BackColor ( ) – Button Face;
    Visible ( ) – False;
    BordureStyle ( ) – 0 – None;
    Locked ( ) – False.
4 Command1 ( ) Default -
    True Click -
    Enter. Cancel -
    Command2 ( ) True -
    Click Esc.
5 -
( , , , . .), -
( , , -
. .).
6 Module1. Project =>
Add Module ( => ). -
:

```

```

Function f(X As Single) As Single
If X <= 0 Then

```

```

        f = Sin(X ^ 2 + Form1.A * X)
    ElseIf X <= Form1.A Then
        f = 1 - (1 + Sqr(X2 + Form1.A * X)) / (Exp(Sin(X)) * (1 + X))
    Else
        f = Cos(X ^ 2 - Form1.A ^ 2) / Sqr(1 - Sin(X - Form1.A)) - _
            (1 - Sin(Form1.A - X)) / Exp(Sin(X))
    End If
End

```

Form1.

```

7      (Text)
      Click      Command1 (      )
      :

```

```

Private Sub Command1_Click()
    Y = f(X)
    Y.Visible = True
End

```

```

      Text      Y (      Text
).      (      ), . . .
      Visible (      )      True (      ).
8      Click      Command2 (      )      :

```

```

Private Sub Command2_Click()
    End
End Sub

```

```

9      GotFocus (      )      X -
      :

```

```

Private Sub X_GotFocus()
    Y.Visible = False
End Sub

```

```

        (
            ,
            Tab    Shift + Tab)
    Y,
    10      GotFocus -
        A:
        Private Sub A_GotFocus()
            Y.Visible = False
        End Sub
    11      LostFocus (
        :
        Private Sub X_LostFocus()
            If Not IsNumeric(X) Then
                X.SetFocus
                MsgBox "
            End If
        End Sub
    ,
    ..
    .
        IsNumeric()
        MsgBox
    ,
    12      LostFocus    A
        Private Sub A_LostFocus()
            If Not IsNumeric(A) Then
                A.SetFocus
                MsgBox "
            End If
        End Sub

```

13

4:

```

: L2_< >_Form1
: L2_< >_Module1
: L2_< >_Project

```

14

13

3

```

: ;
;
:
,
.
.

```

13.1

```

-
,
,
,
)
;

```

) - ,
 ;
) - ;
) - .
 -

n

h. .
 (= *n*), -

h (= +***h***). -

, , ,
 (>).

, .
 () -
 . (-
) () , -
 () . -
 () ,
 .

13.2

1 ***Visual Basic*** , ,
Lab3.

2 , 20. -

:
) (***TextBox***):
 A - ;

X_{nac} - ;
 X_{kon} - ;
 hx - ().
) (L_{bel}) ;
) :
 $Command1$ - ;
 $Command2$ - , .

Лабораторная работа №3 Выполнил Иванов ...

**Табулирование функции.
Лабораторная работа №3**

Введите значение А

Введите начальное значение

Введите конечное значение

Введите шаг табулирования

Расчет Выход

20 – Form1

3 $Project \Rightarrow Add Form (\Rightarrow$
) $Form2$ -
 , -
 , 21.


```

Form2.Print " x", " f(x)"
Form2.CurrentX = 1000
Form2.Print
Do While X < Xkon
    y = f(X)
    Form2.CurrentX = 1000
    Form2.Print Format(X, "####0.00"), Format(y, "###0.000")
    If y > YMax Then YMax = y
    If y < YMin Then YMin = y
    X = X + hX
Loop
Form2.Print
    Form2.Print "                ", Format(YMax, "###0.000")
    Form2.Print "                ", Format(YMin, "###0.000")
End Sub

```

6

```

Command2                Xnac, Xkon, hx A                ,
                            2 ( . 8...12).

```

7

```

,                ,                -
4, . .                :

```

```

1:    L3_<    >_Form1
2:    L3_<    >_Form2
:    L2__<    >_Module1
:    L3_<    >_Project

```

8

```

.                -
,                .

```

```

:
;
;
:
,
,
.
.

```

14.1

```

,
3:
•
•
, . . .
;
•

```

```

Form2
VscrollBar (
Change,
Value. ( . .
Value) Max Min -

```

Resize ,
(. . .).

– *TabFunc* (. . .).

PrntFunc (. . .).

Dim Public

(. . .):

Public Dim < > (< >) As < >

. C c (General) (Declaration) (() (Redim -)).

Redim < > (< >)[As< >] Dim Redim

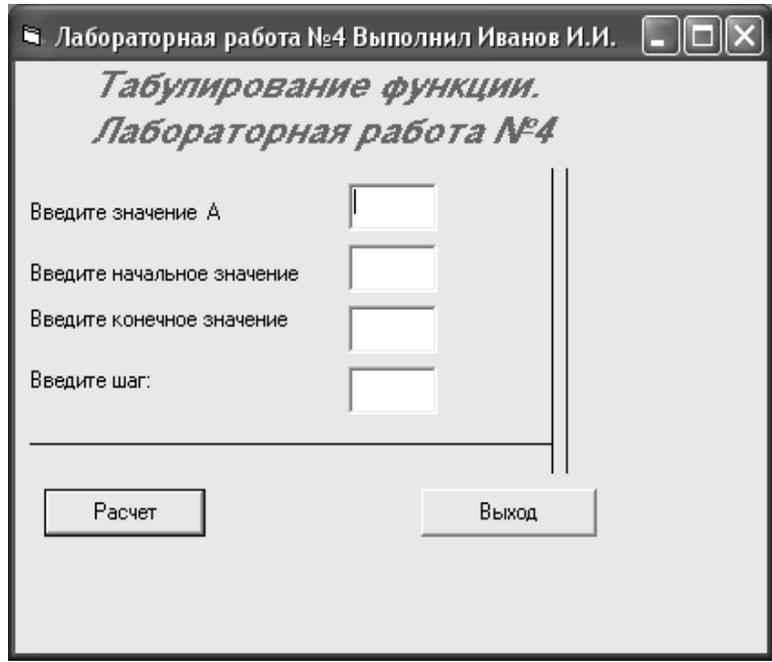
Dim.

14.2

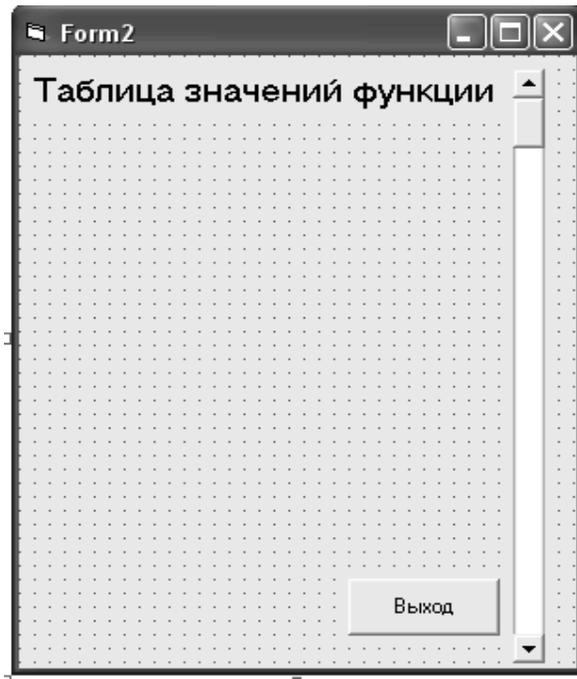
1 Visual Basic, Lab4.

2 Form1, 22. - Lab3.

3 Form2, VscrollBar (), 23.



22 – Form1



23 - Form2

• *SmallChange* = 1 (*Value*);

• *LargeChange* = 10 (*Value*).

(*Min*) -

(, . . .) -

(*Max*) -

4 *Module1*, *Lab2*

(3, . 4).

5 *Module2*.

:

```
Public XMin As Single, XMax As Single
Public YMin As Single, YMax As Single
Public n As Integer
Public MX() As Single, MY() As Single
```



```

Sub PrntFunc()
    Form2
    Form2.Cls
    Form2.CurrentY = 800
    Form2.CurrentX = 1000
    Form2.Print " x", " f(x)"
    Form2.CurrentX = 1000
    Form2.Print
    Form2
    Form2
    Form2
    Value (i) Form2)
    ( )

For i = 0 To n
    If i >= Form2.VScroll1.Value Then
        Form2.CurrentX = 1000
        Form2.Print Format(MX(i), "####0.00"), Format(MY(i),
"###0.000")
    End If
Next

Form2.Print
Form2.Print " ", Format(YMax,
"###0.000")
Form2.Print " ", Format(YMin, "###0.000")
    Form2

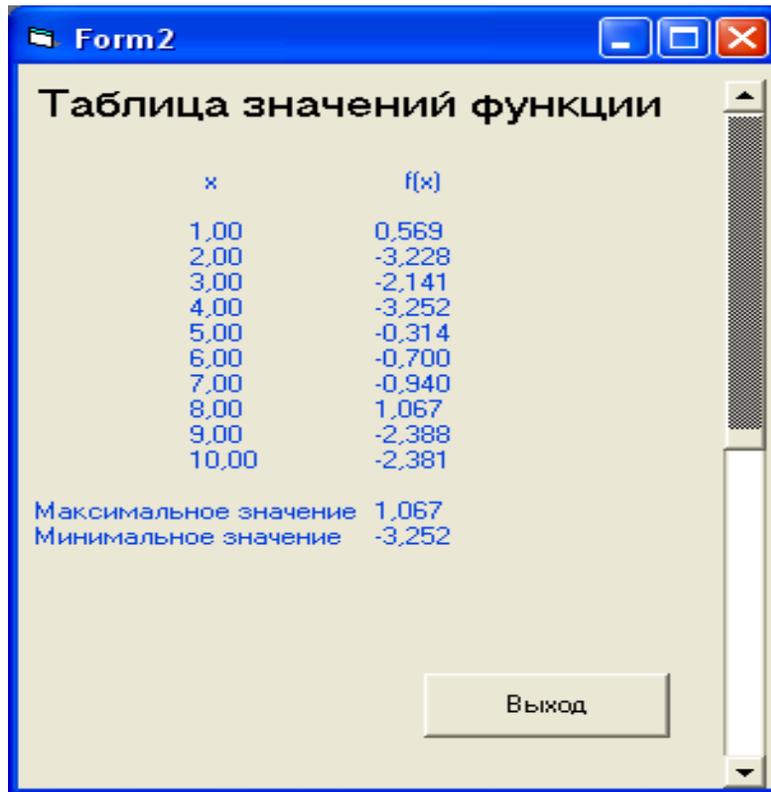
End Sub

```

```

6 Form1 ( -
2 3): -

```

24 –

15

5

:

Visual Basic;

-

:

Lab4

,

15.1

, :

Pset - ;

Line - ;

Circle -

()

,

.

.

-

,

ScaleHeight ScaleWidth.

().

,

.

-

Xn, Xk

Ymin Ymax (

).

(**Xn, Ymin**).

.

T

,

()

:

kX = ScaleWidth / (Xmax-Xmin)

kY = ScaleHeight / (Ymax-Ymin)

:

X = (X - Xmin) * kX

Y = (Ymax -Y) * kY

15.2

1 Visual Basic () Lab4. -
Lab5.

2 Form1 Form2
, Lab5.
File -
Save < > As....

4:

L5_< >_Form1
L5_< >_Form2

(
File => Save Project As...(=>
...)
:

L5_< >_Project

3 (Caption) Form1 -
Label.

4 Form3.

5 Module3, :

Public Kx As Single
Public Ky As Single
Public Sub Graph()

Dim i As Integer

,

If XMin > 0 Then XMin = -(XMax - XMin) / 50

If XMax < 0 Then XMax = (XMax - XMin) / 50

If YMin > 0 Then YMin = -(YMax - YMin) / 50

If YMax < 0 Then YMax = (YMax - YMin) / 50

,

(

,

)

Kx = Form3.ScaleWidth / (XMax - XMin)

Ky = Form3.ScaleHeight / (YMax - YMin)

,

Form3.Cls

Form3.Line (EkrX(0), 0)-(EkrX(0),

Form3.ScaleHeight)

Form3.Line(0,EkrY(0))-(Form3.ScaleWidth,EkrY(0))

,

For i = 1 To n

Form3.PSet (EkrX(MX(i)), EkrY(MY(i)))

Next

End Sub

Function EkrX(x As Single) As Integer

,

Clnt

(

EkrX = Clnt((x - XMin) * Kx)

End Function

Function EkrY(y As Single) As Integer

,

EkrY = Clnt((YMax - y) * Ky)

End Function

6

Click

Command1 ()

Form1

```

,
Click
Command2 ( ) – Form3. -
( ):

Private Sub Command1_Click()
,
,
:
, * -
, * -
, * -
,
, ( Visible)
, ( SetFocus)
TabFunc Xnac, Xkon, hX
Form2.Visible = True
Form2.SetFocus
PrntFunc
Form3.Visible = True
Form3.SetFocus
Graph
End Sub

Private Sub Command2_Click()
,
Unload Form2
Unload Form3
End
End Sub

Form2.SetFocus Form3.SetFocus ,
« » ( -
).
7 Form3 :

```

```
Private Sub Form_Resize()  
    Graph  
End Sub
```

8

(*FormLayout*),

9

Module3

,

4:

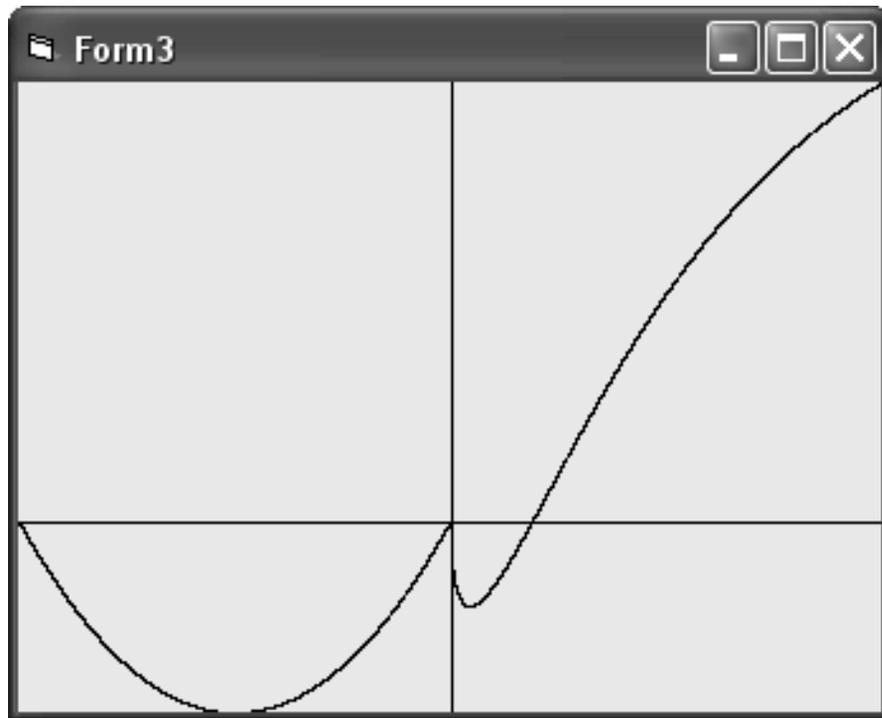
L5_< >_Module3

10

« ».

Form3.

25.



25 –

```

    .
    «      »      :
    .      ,      ,      .
    - «      »      ,      -
    ,      .
    ,      Graph      -
    :

```

```

For i = 1 To n
Form3.Line(EkrX(MX(i-1)),EkrY(MY(i-1)))-(EkrX(MX(i)),EkrY(MY(i)))
Next

```

16 **6**

```

,      ,
:      ;      -

```

Common Dialog Box

```

:      Lab5      ,
(      )

```

Common Dialog Box.

16.1

```

- , -
. -
-
.
:
Open < > For < > As #< > ,
< > - , -
: :| \ . -
;
< > - :
Input - ;
Append - ;
< > - ,
.
:
Write # < > , < > >
:
Input # < > , < > >
:
Close # < >
Write # Input # (
) ( ) .
, -
EOF(< >),

```

« » (*True*), ,

« » (*False*) – .

(*Open*)

(-

). , , -

. -

. -

, -

, -

Windows « » « ».

Common Dialog Box.

. -

. -

, .

, , *Common Dialog Box* -

, -

,

Project ⇒ *Components* (⇒).

16.2

- 1 *Visual Basic* () *Lab5.* -
- Lab6.*
- 2 *Form1, Form2 Form3,* -
- ,
- 4.
- 3 (*Caption*) *Form1* -
- Label.*

4

Common Dialog Box.

:

- *Project* ⇒ *Components* (⇒);
- *Controls* () -
- *Microsoft Common Dialog Control 6.0;*
- .

5

Form1

Common Dialog Box

db.

6

Form1

Command3

« ».

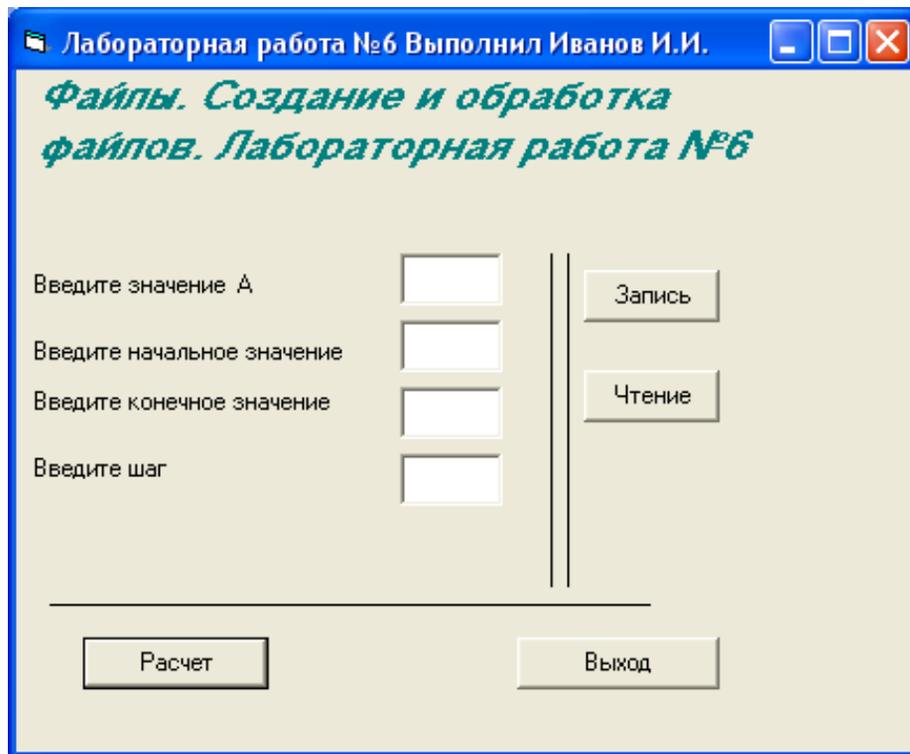
7

Form1

Command4

« ».

26.



26 –

Form1

8

Command3 Command4

:

```

Private Sub Command3_Click()
,
    Dim Str As String
    cdb.DialogTitle = "
,
'Command Dialog Box
    cdb.ShowSave
,
'Command Dialog Box
,
,
    ( - ) - InitDir -
,
    FileName
    Str = cdb.InitDir & cdb.FileName
    Open Str For Output As #1
,
    . ( - )
,
    Command Dialog Box
,
    Write #1, n, XMin, XMax, YMin, YMax
,
    For i = 0 To n
        Write #1, MX(i), MY(i)
    Next
,
    Close #1
,
End Sub

Private Sub Command4_Click()
,
    Dim Str As String
    cdb.DialogTitle = "
,
'Command Dialog Box

```


Visual Basic

Lab7,

Lab6

17.1

Lab6

Windows,

Visual Basic

– Menu Editor (

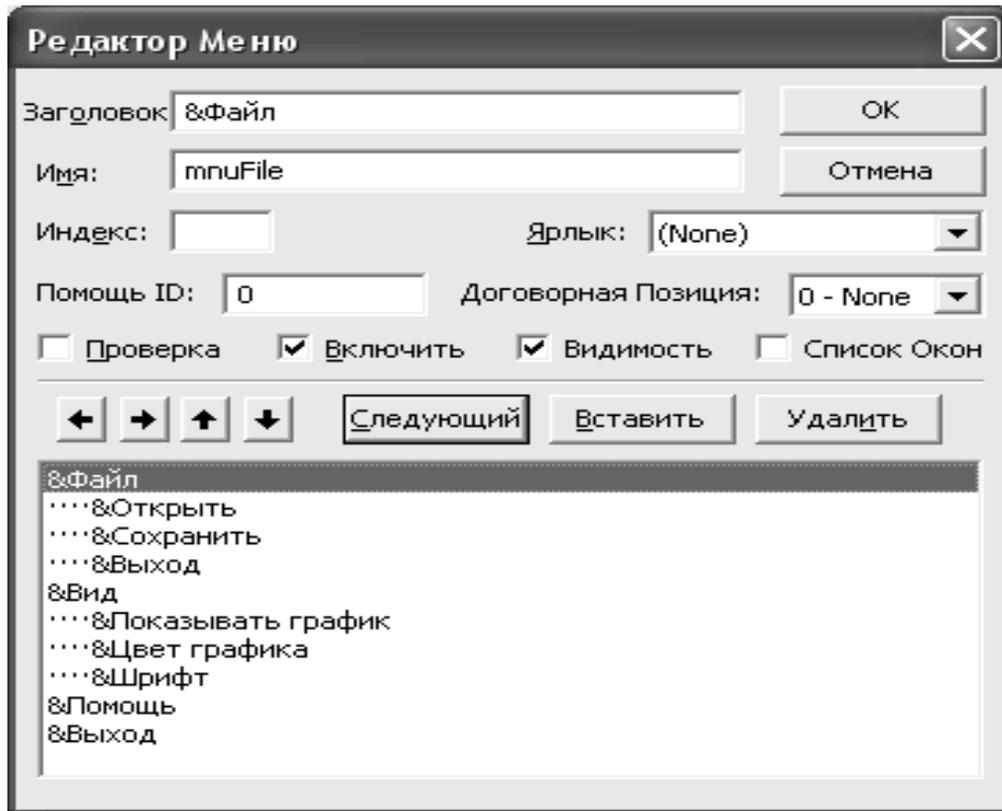
Form

Ctrl + E

: Tools ⇒ Menu Editor (

⇒

27



27 –

Menu Editor

).

(Insert -),

(Delete -),

().

) ,

(-

() ().

() . - *Click()*
, - ,
« »., , -

Click. -

(),
(). *Visual Basic* -
Form, -
, , -

()
Code () .

17.2

1 *Visual Basic* () *Lab6.* -
Lab7. ,

, 4.
2 *Ctrl + E* .

3 *Caption ()*
- «& ». & ()
« » *lt +* .

Name() , -
- *mnuFile.* -

4 *Next ()*, -
Menu Editor .

```

5          «          »          mnuFileOpen,
          3.
          ,
          .
6          mnuFileSave (          ) mnu-
FileExit (          ) mnuFile.
7          - mnuView (          )          mnuViewGraph
(          ), mnuViewColor (          ) mnuViewFont
(          ).          mnuViewGraph
          Checked (          ).          « -
»          ,          ,          -
          . «          »          «          »          Checked
          mnuViewGraph.
8          mnuHelp (          ) mnuExit (          ).
9          (          ) -
          Click.

```

Common Dialog Box

```

Private Sub mnuFileOpen_Click()
,
    Dim Str As String
    cdb.DialogTitle = "          "
,
    'Command Dialog Box
    cdb.ShowOpen
,
    'Command Dialog Box
,
,
,
    InitDir          -          (          -          ) -
    Str = cdb.InitDir & cdb.FileName

```



```

Else
    mnuViewGraf.Checked = False
    Form3.Visible = False
End If
End Sub

Private Sub mnuViewHelp_Click()
    MsgBox "                "
End Sub

Private Sub mnuExit_Click()
    ,

    Unload Form2
    Unload Form3
End
End Sub

Private Sub mnuFileExit_Click()
    ,

    Unload Form2
    Unload Form3
End
End Sub

Private Sub Xnac_LostFocus()
    If Not IsNumeric(Xnac) Then
        Xnac.SetFocus
        MsgBox "                :                "
    End If
End Sub

Private Sub Xkon_LostFocus()
    If Not IsNumeric(Xkon) Then
        Xkon.SetFocus
        MsgBox "                :                "
    End If
End Sub

Private Sub hX_LostFocus()
    If Not IsNumeric(hX) Then
        hX.SetFocus
        MsgBox "                :                "
    End If
End Sub

Private Sub A_LostFocus()

```

```

If Not IsNumeric(A) Then
    A.SetFocus
    MsgBox "                :                "
End If
End Sub

```

```

Private Sub Command1_Click()
',
',
', * _
', * _
', * _
    TabFunc Xnac, Xkon, hX
    Form2.Visible = True
    Form2.SetFocus
    PrntFunc
    If mnuViewGraf.Checked = True Then
        Form3.Visible = True
        Form3.SetFocus
    End If
    Graph

```

End Sub

```

Private Sub Command2_Click()
',

    Unload Form2
    Unload Form3
    End
End Sub

```

10

Graph,

Form1.cdb.Color.

mnuViewFont_Click() -

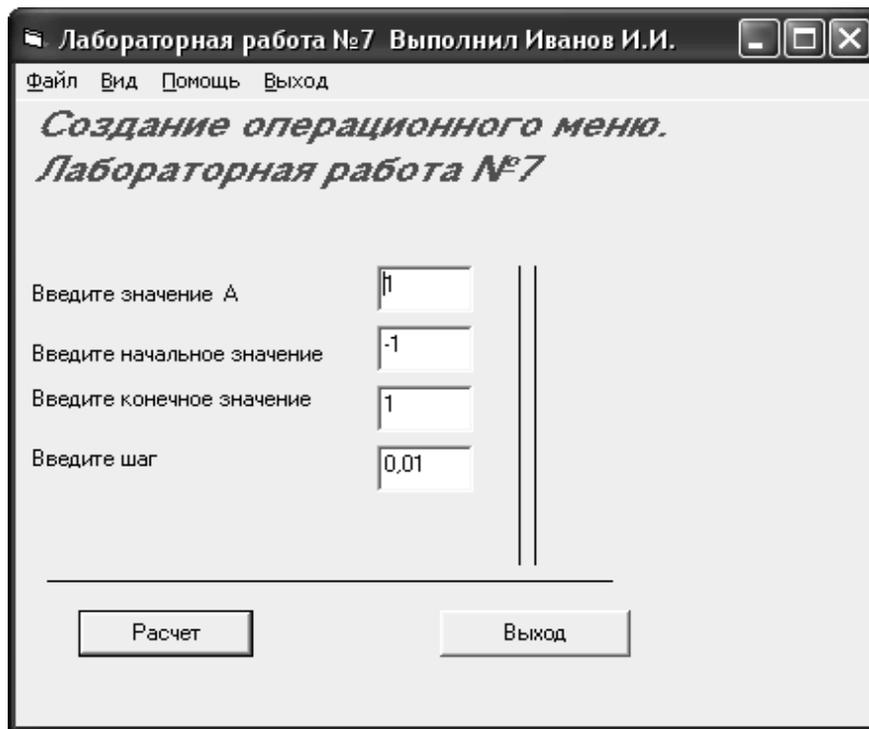
Flags.

Visual Basic,

True Top, -

Form1

28.



28 –

Form1

18

8

:

Picture Box,

Timer.

Interval ()

Timer

« ».

18.1

1 *Face02.ico* *Face03.ico*

2 *Visual Basic*

Lab8.

3 *Image* *Picture*

Face02.ico.

4 *Timer.* *Interval*

Picture 100, . . 100 .

5 *Timer:*

```
Private Sub Timer1_Timer()  
    Static Flag As Boolean  
    If Image1.Top < 0 Or Image1.Top >=  
Form1.ScaleHeight - Image1.Height Then  
        PHeight = -PHeight  
    End If  
    If Image1.Left<0 Or Image1.Left>=  
Form1.ScaleWidth-Image1.Width  
    Then  
        PWidth = -PWidth  
    End If  
  
    If Flag = True Then  
        Flag = False  
        Image1.Picture=LoadPicture("Face03.ico")  
    Else  
        Flag = True  
        Image1.Picture=LoadPicture("Face02.ico")  
    End If
```

```
Image1.Top = Image1.Top + PHeight  
Image1.Left = Image1.Left + PWidth
```

End Sub

Flag -

PHeight PWidth ()

6 , :

L8_< >_Form1
L8_< >_Project

7 (*F5*), -

“ ” “ ”.

8 *Interval Timer Step*

(),

9 ,

:

- ;
- ;
- .
- ;
- .

PHeight PWidth *General.* -

:

Public PHeight As Integer
Public PWidth As Integer

```

        Private Sub mnuInterval_Click()
            Dim str As String
        Do
            str=InputBox("
                "
            If IsNumeric(str) Then
                Timer1.Interval = str
                Exit Do
            Else
                MsgBox "
                    :
            End If
        Loop
    End Sub

    Private Sub mnuPeremGor_Click()
        Dim str As String
    Do
        str = InputBox("
            "
        If IsNumeric(str) Then
            PWidth = str
            Exit Do
        Else
            MsgBox "
                :
        End If
    Loop

    End Sub

    Private Sub mnuPeremVert_Click()
        Dim str As String
    Do
        str = InputBox("
            "
        If IsNumeric(str) Then
            PHeight = str
            Exit Do
        Else
            MsgBox "
                :
        End If
    Loop
    End Sub

    Private Sub Exit_Click()
        End
    End Sub

```

```

Private Sub Timer1_Timer()
    Static Flag As Boolean
    If Image1.Top < 0 Or Image1.Top >= Form1.ScaleHeight - Image1.Height
Then
        PHeight = -PHeight
    End If
    If Image1.Left < 0 Or Image1.Left >= Form1.ScaleWidth - Image1.Width
Then
        PWidth = -PWidth
    End If

    If Flag = True Then
        Flag = False
        Image1.Picture = LoadPicture("Face03.ico")
    Else
        Flag = True
        Image1.Picture = LoadPicture("Face02.ico")
    End If

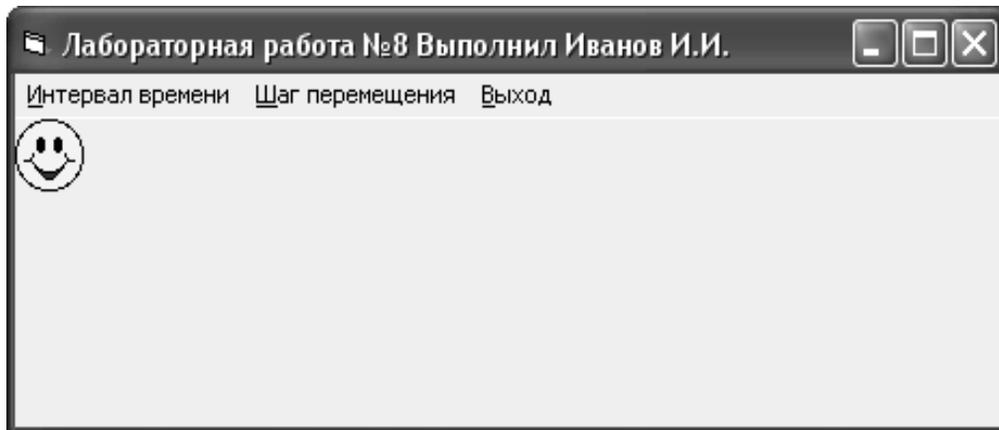
    Image1.Top = Image1.Top + PHeight
    Image1.Left = Image1.Left + PWidth

End Sub

```

Form1

29.



29 –

Form1

	$f1(x)$	$f2(x)$	$f3(x)$
	2	3	4
1	$\text{ctg}(2x^3)$	$\sqrt[3]{x-1}$	$\cos(x-2)$
2	$\cos(3x^2)$	$\sqrt{x^3}$	$\ln(5x)$
3	$\sin(x^3+5)$	$\ln(4x+1)^2$	$\sqrt{x+1}$
4	x^4+2x^3-x	$\sin^2(x^3)$	$\sin(x^3)$
5	x^5	$\ln(x+1)$	$\sqrt[3]{x}$
6	$\sin(4x^3)$	$\sqrt[5]{6x-x^2+1}$	$\text{Sin}(2x+1)^3$
7	$\text{ctg}(3x-1)^2$	$2+xe^{-x}$	$\sin^3(x^2)$
8	$\sin(x^3+1)$	$(x-1)^3$	$\sqrt{1+x^3}$
9	$ x ^2$	$\sin(x^2)$	$\ln^2(x)$
10	$\sin^2(x^3)$	$\ln(x^3+3)$	e^{-x}
11	$2xe^{-x}$	$\ln(x+1)$	x^x
12	$\ln(2x+5)$	$\sin(e^x)$	$\sqrt[3]{x}$
13	$\sin(2x+1)$	$\cos(x^3)$	$\sin(x)^2$
14	$\sin(x)^2$	$\sqrt[4]{x}$	$\ln(x^3)$
15	$3x-1$	$\ln^2(x)$	$\sqrt{1+x^2}$
16	$\cos(x)$	$1/(\text{tg}(2x)+1)$	x^2e^{-x}
17	$ x ^2$	$x^2\cos(x)$	$\sin(x^2)$
18	$\text{tg}(2x)$	$\cos(2x)$	$\ln^2(x)$
19	$1/x^5$	e^x+1	$\sin(x^5)$
20	$3x^5$	$\sin(4x+1)^2$	$\ln(x+1)$
1	2	3	4
21	$\sqrt{4+x^2}$	3^x+3	5^x+1
22	e^{-3x}	$\sin^3(x^4)$	$\sqrt[3]{3x}$
23	$\sin(e^x)$	$\text{tg}(2x)$	$\sqrt{1+x^2}$
24	$\cos(x^3)$	$1/x^5$	x^2e^{-x}
25	$\sqrt[4]{x}$	$3x^5$	$\sin(x^2)$

1 - . QBASIC. . -

∴ - BHV, 1992. - 364 .

2 . QuickBasic 4.5. - ∴

ABF, 1996. - 228 .

3 . . IBM PC. , ,
/ . . , . . . - ∴

, 1993. - 386 .

4 . Visual Basic 6.0 / ,

; . . - ∴ BHV, 2000. - 204 .

5 ., . Visual Basic 6.0. 24

/ . , . ; . . - ∴ « -

», 1999. - 186 .

6 Microsoft Visual Basic 6.0 . :

. / . . - ∴ , 2001. - 368 .

7 . Visual Basic 6: . - ∴ , 2002. - 579 .

8 . Visual Basic 6.0.

/ . , . . - ∴ ,

2000. - 622 .

VISUAL BASIC

60 84/16

. 84313, . , . ,72