```vb
'Ben Wallace
'RCET0265
'Spring 2020
'Etch /a Sketch assignment Assignment
'https://github.com/wallbenj93/BLW-VS-S20

Option Explicit On
Option Strict On

Public Class EtchASketch


    Dim myPen As New Pen(Color.Black)
    Dim penColor As Color
    Dim graph As Graphics
    Dim shakeCount As Integer = 0
    Dim oldX As Integer
    Dim oldY As Integer

    Private Sub EtchASketch_Load(sender As Object, e As EventArgs) Handles
      Me.Load
        graph = PictureBox1.CreateGraphics
    End Sub

    Private Sub EtchASketch_MouseMove(ByVal sender As Object, ByVal e As
      MouseEventArgs) Handles PictureBox1.MouseMove
        Me.Text = "x: " & e.X & " y: " & (e.Y - 0) * 1 & " Mouse Button: " &
            e.Button.ToString
        XYCoordinates.Text = "X = " & (e.X - 500) & vbNewLine & "Y = " & (e.Y -
          200) * -1
        'Me.Text = Me.Location.ToString
        'create graphics object
        'graph = Me.CreateGraphics
        graph = PictureBox1.CreateGraphics


        'constructor for pen object
        If penColor.IsEmpty = True Then
            penColor = Color.Black
        End If

        myPen.Color = penColor



        If e.Button.ToString <> "None" Then
            'draw the line
            graph.DrawLine(myPen, oldX, oldY, e.X, e.Y)
        End If

        'store position
        oldX = e.X
```

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50          oldY = e.Y
51
52          'free up resources
53          'myPen.Dispose() code breaks if this is uncommented???
54          'graph.Dispose()
55      End Sub
56
57
58      Private Sub ColorChangeButton_Click(sender As Object, e As EventArgs) Handles
           ColorChangeButton.Click, ChangeColorToolStripMenuItem.Click
59          'use color pallet to change color
60          ColorDialog1.ShowDialog()
61          penColor = ColorDialog1.Color
62          myPen.Color = penColor
63      End Sub
64
65      Private Sub EraseButton_Click(sender As Object, e As EventArgs) Handles
          EraseButton.Click, EraseToolStripMenuItem.Click
66          'shake form and erase
67
68          'starting y value of location of program at time of button click
69          Dim oldTop As Integer = Me.Top
70
71          'make it do line 64 and line 66 multiple times as a way to make it take
72          'longer between moving up and moving back down
73          'NOTE: not an efficient method since this wont always take exactly the
74          'same amount of time to run, especially from one pc to the next
75          Dim waitX As Integer = 9000000
76          For j = 1 To 3
77              For i = 1 To waitX
78                  If i < CInt(waitX / 2) Then
79                      'move up
80                      Me.Top = oldTop - 20
81                  Else
82                      'move back to previous position
83                      Me.Top = oldTop
84                  End If
85
86                  'Me.Top += 20
87                  'Threading.Thread.Sleep(2000)
88              Next
89          Next
90          graph.Clear(BackColor)
91          XYCoordinates.Hide()
92          KeyLabel.Hide()
93          'ShakeSub()
94      End Sub
95
96      'Sub ShakeSub()
97      '    If shakeCount = 3 Then
98      '        graph.Clear(BackColor)
99      '        shakeCount = 0
```

```
100     '    Else
101     '        Me.Top -= 100
102     '        Timer1.Start()
103     '        Threading.Thread.Sleep(500)
104     '    End If
105     'End Sub
106     'Private Sub Timer1_Tick(sender As Object, e As EventArgs) Handles
          Timer1.Tick
107
108     '    Timer1.Stop()
109     '    Me.Top += 100
110     '    shakeCount += 1
111     '    ShakeSub()
112     'End Sub
113
114     Private Sub DrawWaveformButton_Click(sender As Object, e As EventArgs)
          Handles DrawWaveformButton.Click, DrawWaveformsToolStripMenuItem.Click
115         'erase pic box
116         graph.Clear(BackColor)
117
118
119         'draw 10x10 scope graticule
120         Dim x As Decimal
121         Dim y As Decimal
122         myPen.Color = Color.Black
123         'loops for vertical lines (same x, change y, for each vertical line)
124         For xValue = 100 To 900 Step 100
125             For yValue = 5 To 400 Step 10
126                 graph.DrawLine(myPen, xValue, yValue, xValue, yValue + 5)
127             Next
128         Next
129
130         'loops for horizontal lines (same y, change x, for each horizontal line)
131         For yValue = 40 To 360 Step 40
132             For xValue = 5 To 1000 Step 10
133                 graph.DrawLine(myPen, xValue, yValue, xValue + 5, yValue)
134             Next
135         Next
136
137         'draw sine wave
138         Dim oldY2 As Decimal = 200
139         Dim oldX2 As Decimal
140         myPen.Color = Color.Green
141         For r = 1 To 2000
142             'dim frequency as integer
143             'Vi = Vp * sin(360 * f * t)
144             'y = 200 - (125 * Math.Sin(2 * Math.PI * frequency * (1 / frequency)
                  * (r / 1000)))
145             x = CInt(r / 2)
146             'x = r
147             y = CDec(200 - 78 * Math.Sin(r / 1000 * 2 * Math.PI))
148             graph.DrawLine(myPen, oldX2, oldY2, x, y)
```

```
149             oldX2 = x
150             oldY2 = y
151         Next
152
153         'draw cosine wave
154         'reset starting position
155         oldY2 = 200 - 78
156         oldX2 = 0
157         myPen.Color = Color.Blue
158         For r = 1 To 2000
159             'y = 200 - (125 * Math.Cos(2 * Math.PI * frequency * (1 / frequency)
                  * (r / 1000)))
160             x = CInt(r / 2)
161             'x = r
162             y = CDec(200 - (78 * Math.Cos(r / 1000 * 2 * Math.PI)))
163             graph.DrawLine(myPen, oldX2, oldY2, x, y)
164             oldX2 = x
165             oldY2 = y
166         Next
167
168         'draw tangent waves
169         'reset starting position
170         oldY2 = 200
171         oldX2 = 0
172         myPen.Color = Color.Brown
173         For r = 1 To 1000
174             'y = 200 - (125 * Math.Tan(2 * Math.PI * frequency * (1 / frequency)
                  * (r / 1000)))
175             'x = 2 * Math.PI / 1000 * r
176             'y = Math.Tan(x) + 200
177             'x = x * 500 * Math.PI
178             x = r
179             y = CDec(200 - 78 * Math.Tan(r / 500 * 2 * Math.PI))
180             If y < -200 Then
181                 y = -200
182             ElseIf y > 600 Then
183                 y = 600
184             End If
185             If (x > 120 And x < 130) Or (x > 370 And x < 380) Or
186                 (x > 620 And x < 630) Or (x > 870 And x < 880) Then
187                 'don't draw vertical undefined lines for tan
188             Else
189                 graph.DrawLine(myPen, oldX2, oldY2, x, y)
190             End If
191
192             oldX2 = x
193             oldY2 = y
194         Next
195
196         KeyLabel.Text = "Key: " & vbNewLine & "Green = Sin, Blue = Cos,  Brown =
              Tan"
197         KeyLabel.Show()
```

```
198             XYCoordinates.Show()
199         End Sub
200
201
202     End Class
203
204
205
206     'todo (not finished due to time)
207     'fix "global variables"
208     'related to global: free up resources?
209     'cleanup code(with more subs?)
210     'add scaling in case form is re-sized by user or moved off screen or minimized
211     'add ability to do just one waveform in menu button?
```