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**Міністерство освіти і науки України
Національний технічний університет
«Дніпровська політехніка»**



**ЗВІТ
про виконання лабораторних робіт
з дисципліни
«Об'єктно-орієнтоване програмування»
Лабораторна робота № 4**

Виконав:
студент гр. 121-19-2
Назаркин С. А.

Прийняв:
викладач каф.
Приходченко С.Д.

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Варіант 17

Фігура: восьмикутник та окружність.

Код класу CGraphicsObject:

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

namespace LW_4
{
    public abstract class CGraphicsObject
    {
        protected Point point;
        protected Point[] points;
        protected Pen pen;
        protected int x;
        protected int y;
        protected int width;
        protected int height;
        protected double perimeter;

        public virtual void show(PaintEventArgs e)
        {
        }
    }
}
```

Код класу Cpoint:

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

namespace LW_4
{
    public class CPoint : CGraphicsObject
    {
        public Point Point
        {
            get { return point; }
            set { point = value; }
        }

        public CPoint()
        {
        }

        public CPoint(Point p)
        {
            point = p;
        }
    }
}
```

```

    }

    ~CPoint()
    {

    }

    public override void show( PaintEventArgs e)
    {
    }
}
}

```

Код класу Octagon:

```

using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

namespace LW_4
{
    public class Octagon : CPoint
    {
        public Point[] Points
        {
            get { return points; }
            set { points = value; }
        }

        public Pen Pen
        {
            get { return pen; }
            set { pen = value; }
        }

        public double Perimeter
        {
            get { return perimeter; }
            set { perimeter = calculateP(); }
        }

        public Octagon()
        {

        }

        public Octagon(Pen penOct, Point[] p)
        {
            pen = penOct;
            points = p;
        }

        ~Octagon()
        {

        }
    }
}

```

```

        public double calculateP()
        {
            double p = 0;
            for (int i = 0; i < 8; i+=2)
            {
                p += Math.Sqrt((Math.Pow((points[i + 1].X - points[i].X), 2) +
(Math.Pow((points[i + 1].Y - points[i].Y), 2))));
            }
            return p;
        }

        public static double operator *(Octagon oct, Circle c)
        {
            double p = oct.calculateP() * c.calculateP();
            return p;
        }

        public static double operator *(Circle c, Octagon oct)
        {
            double p = oct.calculateP() * c.calculateP();
            return p;
        }

        public override void show(PaintEventArgs e)
        {
            e.Graphics.DrawPolygon(pen, points);
        }
    }
}

```

Код класу Circle:

```

using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

```

```

namespace LW_4
{

```

```

    public class Circle : CPoint
    {
        public Pen Pen
        {
            get { return pen; }
            set { pen = value; }
        }

        public int X
        {
            get { return x; }
            set { x = value; }
        }

        public int Y
        {
            get { return y; }
            set { y = value; }
        }
    }
}

```

```

    public int Width
    {
        get { return width; }
        set { width = value; }
    }

    public int Height
    {
        get { return height; }
        set { height = value; }
    }

    public double Perimeter
    {
        get { return perimeter; }
        set { perimeter = calculateP(); }
    }

    public Circle()
    {
    }

    public Circle(Pen penC, int xC, int yC, int widthC, int heightC)
    {
        pen = penC;
        x = xC;
        y = yC;
        width = widthC;
        height = heightC;
    }

    ~Circle()
    {
    }

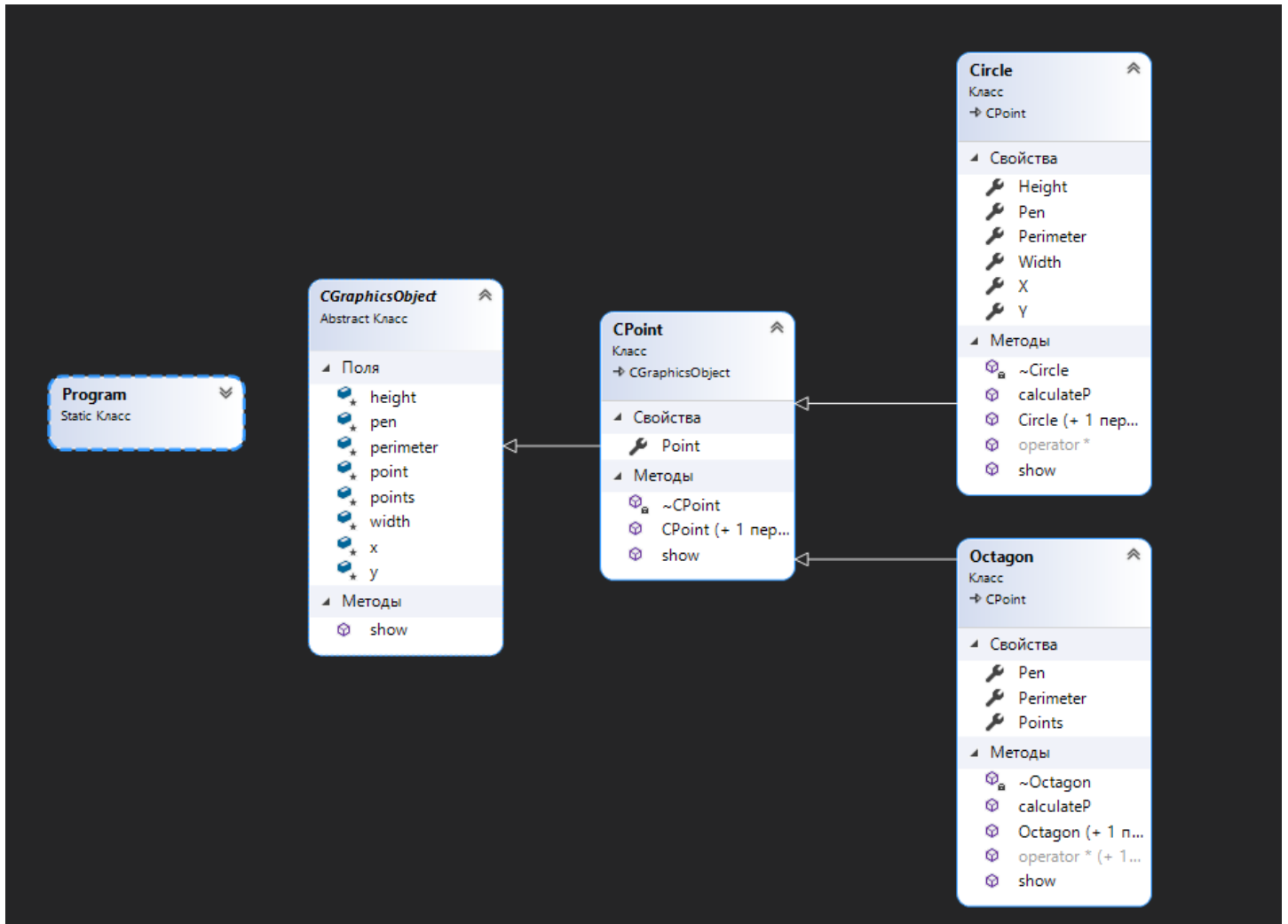
    public double calculateP()
    {
        double p = 2 * Math.PI * (width / 2);
        return p;
    }

    public static double operator *(Circle c, Octagon oct)
    {
        double p = oct.calculateP() * c.calculateP();
        return p;
    }

    public override void show(PaintEventArgs e)
    {
        e.Graphics.DrawEllipse(pen, x, y, width, height);
    }
}

```

Діаграма класів:



The application window 'Form1' contains the following elements:

- Buttons:**
 - 'Draw Octagon' (top left)
 - 'Draw Circle' (top right)
 - 'Calculate Perimeter' (bottom left, highlighted with a blue border)
- Shapes:**
 - A green octagon (center left)
 - A red circle (center right)
- Text:**
 - 'Perimeter = 47123,8898038469' (bottom center)