**Worksheet 11.1 – Answer Sheet**

**ArrayList**

1.

We need four vertices for our rectangle.

Please provide them in consecutive order.

Give me the x coordinate for point A: 1.5

Give me the y coordinate for point A: 2.1

Give me the x coordinate for point B: 9.7

Give me the y coordinate for point B: 2.1

Give me the x coordinate for point C: 9.7

Give me the y coordinate for point C: 7.3

Give me the x coordinate for point D: 1.5

Give me the y coordinate for point D: 7.3

Point A is (1.5,2.1)

Point B is (9.7,2.1)

Point C is (9.7,7.3)

Point D is (1.5,7.3)

The area of the rectangle is 42.64

2. Revisions are highlighted in yellow

**import** java.awt.geom.\*; // for Point2D.Double

**import** java.util.\*; // for ArrayList

**class** Rectangle2{

**public** Rectangle2()

{}

**public** void input5thPoint(ArrayList myRect){

System.out.println("Now add a 5th point on the line segment

connecting points A and B");

Scanner in = **new** Scanner();

System.out.print("Give me the x coordinate for the 5th point: ");

**double** x = in.nextDouble();

System.out.print("Give me the y coordinate for the 5th point: ");

**double** y = in.nextDouble();

Point2D.DoublemyPoint = **new** Point2D.Double(x,y);

myRect.add(myPoint);

}

**public** **double** calculateTriangleArea(ArrayList myRect){

Point2D.DoubleptA = (Point2D.Double)myRect.get(0);

Point2D.DoubleptB = (Point2D.Double)myRect.get(1);

Point2D.DoubleptC = (Point2D.Double)myRect.get(2);// not needed

Point2D.DoubleptD = (Point2D.Double)myRect.get(3);

Point2D.DoubleptE = (Point2D.Double)myRect.get(4);

**double** base = ptA.distance(ptE);

**double** height = ptA.distance(ptD);

**return** base \* height / 2;

}

**public** **void** input(ArrayList myRect)

{

System.out.println("We need four vertices for our rectangle.");

System.out.println("Please provide them in consecutive order.");

Scanner in = **new** Scanner();

**for** (**char** ch = 'A'; ch <= 'D'; ch++)

{

System.out.print("Give me the x coordinate for point " + ch + ": ");

**double** x = in.nextDouble();

System.out.print("Give me the y coordinate for point " + ch + ": ");

**double** y = in.nextDouble();

Point2D.DoublemyPoint = **new** Point2D.Double(x,y);

myRect.add(myPoint);

}

}

**public** void output(ArrayList myRect)

{

**for** (char ch = 'A'; ch <= 'D'; ch++)

{

Point2D.Doublept = (Point2D.Double)myRect.get(ch – ‘A’);

System.out.println("Point " + ch + " is (" + pt.getX() + ","

+ pt.getY() + ")");

}

}

**public** **double** calculateArea(ArrayList myRect)

{

Point2D.DoubleptA = (Point2D.Double)myRect.get(0);

Point2D.DoubleptB = (Point2D.Double)myRect.get(1);

Point2D.DoubleptC = (Point2D.Double)myRect.get(2);// not needed

Point2D.DoubleptD = (Point2D.Double)myRect.get(3);

**double** base = ptA.distance(ptB);

**double** height = ptA.distance(ptD);

**return** base \* height;

}

**public** **static void** main(String[] args)

{

Rectangle2 app = **new** Rectangle2();

ArrayList myRectangle = **new** ArrayList();

app.input(myRectangle);

app.output(myRectangle);

**double** area = app.calculateArea(myRectangle);

System.out.println("The area of the rectangle is " + Format.right(area,5,2));

app.input5thPoint(myRectangle);

**double** area2 = app.calculateTriangleArea(myRectangle);

System.out.println("The area of the triangle that connects this new

point with points A and D is " + Format.right(area2,5,2));

}

}