rectangle

A structure called Point is defined to represent a point in 2D which is given as follows:

```
typedef struct {
   double x;
   double y;
} Point;
```

Another structure called Rectangle is defined as follows:

```
typedef struct {
   Point topLeft;    /* top left point of rectangle */
   Point botRight;   /* bottom right point of rectangle */
} Rectangle;
```

Write a C program that reads in the top left point and bottom right point of a rectangle, computes the area of the rectangle and prints the area of the rectangle on the screen. Your program should include the following three functions with prototypes:

(1) `void getRect(Rectangle *r);` /* read in the two points of rectangle */
(2) `void printRect(Rectangle r);` /* print the coordinates of two points of rectangle */
(3) `double findArea(Rectangle r);`/* return the area of rectangle */

A sample program template is given below to test the functions:

```
#include <stdio.h>
#include <math.h>
typedef struct {
   double x;
   double y;
} Point;
typedef struct {
   Point topLeft;    /* top left point of rectangle */
   Point botRight;   /* bottom right point of rectangle */
} Rectangle;
void getRect(Rectangle *r);
void printRect(Rectangle r);
double findArea(Rectangle r);
int main()
{
   Rectangle r;
   int choice;

   printf("Select one of the following options:\n");
   printf("1: getRect()\n");
   printf("2: findArea()\n");
   printf("3: printRect()\n");
   printf("4: exit()\n");
   do {
      printf("Enter your choice: \n");
      scanf("%d", &choice);
      switch (choice) {
         case 1:
            printf("getRect(): \n");
            getRect(&r);
            break;
         case 2:
            printf("findArea(): %.2f\n", findArea(r));
            break;
         case 3:
            printf("printRect(): \n");
            printRect(r);
```

```
            break;
         default:
            break;
      }
   } while (choice < 4);
   return 0;
}
void getRect(Rectangle *r)
{
    /* write your code here */
}
void printRect(Rectangle r)
{
    /* write your code here */
}
double findArea(Rectangle r)
{
    /* write your code here */
}
```

Some test input and output sessions are given below:

(1) Test Case 1:

```
Select one of the following options:
1: getRect()
2: findArea()
3: printRect()
4: exit()
Enter your choice:
1
getRect():
Enter top left point:
1 2
Enter bottom right point:
2 1
Enter your choice:
3
printRect():
Top left point: 1.00 2.00
Bottom right point: 2.00 1.00
Enter your choice:
4
```

(2) Test Case 2:

```
Select one of the following options:
1: getRect()
2: findArea()
3: printRect()
4: exit()
Enter your choice:
1
getRect():
Enter top left point:
1 2
Enter bottom right point:
2 1
Enter your choice:
2
findArea(): 1.00
Enter your choice:
4
```

(3) Test Case 3:

```
Select one of the following options:
1: getRect()
2: findArea()
3: printRect()
4: exit()
Enter your choice:
1
getRect():
Enter top left point:
1 5
Enter bottom right point:
5 5
Enter your choice:
2
findArea(): 0.00
Enter your choice:
4
```

(4) Test Case 4:

```
Select one of the following options:
1: getRect()
2: findArea()
3: printRect()
4: exit()
Enter your choice:
1
getRect():
Enter top left point:
1 5
Enter bottom right point:
2 2
Enter your choice:
3
printRect():
Top left point: 1.00 5.00
Bottom right point: 2.00 2.00
Enter your choice:
2
findArea(): 3.00
Enter your choice:
4
```