

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Question:	1	2	3	4	5	6	7	8	9	Total
Points:	20	10	10	5	25	5	5	5	5	90
Score:										

## Programming

1. (20 points) The radius of a circle inscribed in a triangle,  $r$ , is:

$$r = \frac{2A}{p},$$

where  $A$  is the triangle's area,  $A$ ,  $p$  is the triangle's perimeter.

Starting from the code that we developed in class when we introduced C structures – `point` and `triangle` data types and the function `area` – write the following code:

- a function, `distance`, that calculates the distance between two `points`
- a program that calculates the radius of the circle inscribed in the triangle with the following vertices:

$$a = (2., 2.), \quad b = (-2., 1.), \quad c = (0., -3.).$$

Test data that you may need to debug your program:

$$a = (2., 2.), \quad b = (4., 4.), \quad c = (8., 8.): \quad r \approx 0.$$

$$a = (0., 0.), \quad b = (0., 4.), \quad c = (3., 0.): \quad r = 1.$$

## Programming tools

- (10 points) Place the code you created, your Makefile, and `.indent.pro` file into a dedicated folder and configure it as your local git repository.
- (10 points) Create a dedicated GitHub account for code sharing and homework submissions in `phys2200` class. Email the link to your Github repository to the instructor. Use the subject line '[phys2200] github account - Yourname'.

As a backup, provide the URL of the GitHub account (please type):

<https://github.com/> \_\_\_\_\_

- (5 points) Create (within your existing GitHub account for this class) a dedicated project for Homework 5 assignment. Give the project exactly the following name: **hw04** (all lower case).

5. Push the code you developed for the programming part of your homework assignment to the github project **hw05**. Create (use the github web interface) a meaningful README.md containing the description of your project. Add an appropriate license.

Your project, when ready, must include as following:

- (a) (5 points) working Makefile
- (b) (3 points) .gitignore file,
- (c) (3 points) .indent.pro file
- (d) (10 points) README.md – markdown file with a brief description
- (e) (4 points) license file.

### Multiple choice questions

For each of the following questions or statements, circle the letter corresponding to one response that best answers the question or completes the statement.

6. (5 points) Which of the following is *not* a keyword in C?

- A. for
- B. if
- C. loop
- D. double

7. (5 points) Which of the following code fragments below produce identical output.

- 1. `int x = 0;  
printf("%d", x);`
- 2. `int x = 0;  
printf("%d", 0);`
- 3. `int x = 0;  
printf("%d", x++);`
- 4. `int x = 0;  
printf("%d", ++x);`

- A. only 1 and 2
- B. only 3 and 4
- C. only 1, 2, and 3
- D. all code fragments produce identical output

8. (5 points) Consider the code below.

```
int i, j;  
for (i = 0; i < 5; i++)  
    for (j = i; j < 5; j++)  
        printf("*");
```

How many asterisks does this code print in total?

- A. 5
- B. 10
- C. 15
- D. 25

9. (5 points) Which of the following commands will create a directory `data` in your current working directory?

- A. `cd /data`
- B. `cd data`
- C. `mkdir data`
- D. `mkdir /data`
- E. `ls data`
- F. `pwd ../data`