Activity A

Calculate the equivalent resistance (R) of three resistors in parallel, given:

$$R = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}}$$

Program Inputs

- **What is the value of R1?**

- **What is the value of R2?**

- **What is the value of R3?**

  - *You can safely assume the user will always enter positive numbers for the resistors.*

Program Outputs

- **The equivalent resistance is XXX ohms**

  - *Replace XXX with the equivalent resistance value*

Sample Output

Test Case 1:

```
What is the value of R1? 10
What is the value of R2? 10
What is the value of R3? 20
The equivalent resistance is 4.0 ohms
```

Test Case 2:

```
What is the value of R1? 75
What is the value of R2? 10
What is the value of R3? 2200
The equivalent resistance is 8.79 ohms
```

Test Case 3:

```
What is the value of R1? 5000
What is the value of R2? 100
What is the value of R3? 22.5
The equivalent resistance is 18.3 ohms
```

Activity B

For a given length and width of a rectangle, write a program to calculate and display the perimeter, area and the length of the diagonal of the rectangle.

Program Inputs

- **Enter the length:**

- **Enter the width:**

  - *You can safely assume the user will always enter real numbers for all questions.*

Program Outputs

- **Rectangle perimeter: XXX**

  - *Replace XXX with the perimeter with at most 2 decimal places*

- **Rectangle area: YYY**

  - *Replace YYY with the area with at most 2 decimal places*

- **Rectangle diagonal: ZZZ**

  - *Replace ZZZ with the length of diagonal with at most 2 decimal places*

Sample Output

Test Case 1:
```
Enter the length: 3
Enter the width: 8
Rectangle perimeter: 22.0
Rectangle area: 24.0
Rectangle diagonal: 8.54
```

Test Case 2:
```
Enter the length: 12.5
Enter the width: 35
Rectangle perimeter: 95.0
Rectangle area: 437.5
Rectangle diagonal: 37.17
```

Test Case 3:
```
Enter the length: 5.5
Enter the width: 6.3
Rectangle perimeter: 23.6
Rectangle area: 34.65
Rectangle diagonal: 8.36
```

Activity C

You are given two lines in slope-intercept form $(y = mx + b)$ and must find their intersection point. For example, if Line 1 is $y = x$ and Line 2 is $y = 3$, then the intersect point is $(3, 3)$. Develop a program to find the intersection of any two lines (you can assume there will always be an intersection!).

Program Inputs

- **Enter m for Line 1:**

- **Enter b for Line 1:**

- **Enter m for Line 2:**

- **Enter b for Line 2:**

    - *You can safely assume the user will always enter real numbers for all questions.*

Program Outputs

- **The intersection point is (XXX,YYY)**

    - *Replace XXX with correct x coordinate and YYY with the y coordinate with at most 2 decimal places*

Sample Output

<u>**Test Case 1:**</u>

```
Enter m for Line 1: 1
Enter b for Line 1: 0
Enter m for Line 2: 0
Enter b for Line 2: 3
The intersection point is (3.0,3.0)
```

<u>**Test Case 2:**</u>

```
Enter m for Line 1: 0.5
Enter b for Line 1: 1
Enter m for Line 2: -2
Enter b for Line 2: 20
The intersection point is (7.6,4.8)
```

Test Case 3:

```
Enter m for Line 1: 3
Enter b for Line 1: -5
Enter m for Line 2: 0.01
Enter b for Line 2: 2
The intersection point is (2.34,2.02)
```

Test Case 4:

```
Enter m for Line 1: 20
Enter b for Line 1: 0
Enter m for Line 2: -5.5
Enter b for Line 2: 50
The intersection point is (1.96,39.22)
```