Java → Basic syntax and simple programs → Methods → <u>Functional decomposition</u>

# **Functional decomposition** → **Decompose a math function**

■ Medium ⑤ 7 minutes ②

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Here is a math function that Kate wants to use in her program:

$$f(x) = \left\{ egin{array}{ll} x^2 + 1 & ext{if} & x \leq 0 \ 1/x^2 & ext{if} & 0 < x < 1 \ x^2 - 1 & ext{if} & x \geq 1 \end{array} 
ight.$$

The template for this function is defined below. Let's decompose it!

Your task is to create three additional methods f1, f2, and f3 for each case and complete the method f. Each method should accept x as an argument with double type.

Report a typo

### Sample Input 1:

0.5

## Sample Output 1:

4.0

#### Sample Input 2:

-4

#### Sample Output 2:

17.0

√ Write a program

## Code Editor IDE

```
Java
1 import java.util.Scanner;
   class MultipleFunction {
       public static void main(String[] args) {
6
            Scanner scanner = new Scanner(System.in);
            double x = scanner.nextDouble();
8
            System.out.println(f(x));
9
10
11
       public static double f(double x) {
12
            //call your implemented methods here.
            double result;
13
14
           if (x <= 0) {
15
                result = f1(x);
            } else if (x > 0 \&\& x < 1) {
17
                result = f2(x);
            } else if (x >= 1) {
18
19
                result = f3(x);
20
21
            return result;
22
23
24
       //implement your methods here
        public static double f1(double x) {
25
26
            return x * x + 1;
27
28
29
       public static double f2(double x) {
            return 1 / (x * x);
30
31
32
        public static double f3(double x) {
33
            return x * x - 1;
```

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```
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             36 }
             37
          Continue
                         This problem has been changed. Reload?
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```

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