**5.7 What is the value of x after each of the following statements is executed?**

a) x = Math.abs(7.5);  
**Answer:** 7.5

b) x = Math.floor(7.5);  
**Answer:** 7.0

c) x = Math.abs(0.0);  
**Answer:** 0.0

d) x = Math.ceil(0.0);  
**Answer:** 0.0

e) x = Math.abs(-6.4);  
**Answer:** 6.4

f) x = Math.ceil(-6.4);  
**Answer:** -6.0

g) x = Math.ceil(-Math.abs(-8 + Math.floor(-5.5)));  
Breakdown:

* Math.floor(-5.5) = -6.0
* -8 + (-6.0) = -14.0
* Math.abs(-14.0) = 14.0
* Math.ceil(-14.0) = -14.0  
  **Answer:** -14.0

// 5.8 Parking Charges

import java.util.Scanner;

public class ParkingCharges {

public static double calculateCharges(double hours) {

double charge = 2.0;

if (hours > 3) {

charge += Math.ceil(hours - 3) \* 0.5;

}

return Math.min(charge, 10.0);

}

public static void main(String[] args) {

Scanner input = new Scanner(System.in);

double totalReceipts = 0;

for (int i = 1; i <= 3; i++) { // example for 3 customers

System.out.print("Enter hours parked for customer " + i + ": ");

double hours = input.nextDouble();

double charge = calculateCharges(hours);

totalReceipts += charge;

System.out.printf("Customer %d charge: $%.2f%n", i, charge);

}

System.out.printf("Total receipts: $%.2f%n", totalReceipts);

}

}

// 5.9 Rounding Numbers

import java.util.Scanner;

public class Rounding {

public static void main(String[] args) {

Scanner input = new Scanner(System.in);

System.out.print("Enter a number: ");

double x = input.nextDouble();

long y = (long) Math.floor(x + 0.5);

System.out.printf("Original: %.2f, Rounded: %d%n", x, y);

}

}

// 5.10 Rounding Numbers to Different Decimal Places

public class Rounder {

public static long roundToInteger(double x) {

return (long) Math.floor(x + 0.5);

}

public static double roundToTenths(double x) {

return Math.floor(x \* 10 + 0.5) / 10;

}

public static double roundToHundredths(double x) {

return Math.floor(x \* 100 + 0.5) / 100;

}

public static double roundToThousandths(double x) {

return Math.floor(x \* 1000 + 0.5) / 1000;

}

public static void main(String[] args) {

Scanner input = new Scanner(System.in);

System.out.print("Enter a number: ");

double num = input.nextDouble();

System.out.printf("Original: %.4f%n", num);

System.out.printf("Rounded to integer: %d%n", roundToInteger(num));

System.out.printf("Rounded to tenths: %.1f%n", roundToTenths(num));

System.out.printf("Rounded to hundredths: %.2f%n", roundToHundredths(num));

System.out.printf("Rounded to thousandths: %.3f%n", roundToThousandths(num));

}

}

// 5.12 Random Integer Assignments

import java.util.Random;

public class RandomInts {

public static void main(String[] args) {

Random rand = new Random();

int a = rand.nextInt(2) + 1;

int b = rand.nextInt(100) + 1;

int c = rand.nextInt(10);

int d = rand.nextInt(113) + 1000;

int e = rand.nextInt(3) - 1;

int f = rand.nextInt(15) - 3;

System.out.println("1-2: " + a);

System.out.println("1-100: " + b);

System.out.println("0-9: " + c);

System.out.println("1000-1112: " + d);

System.out.println("-1 to 1: " + e);

System.out.println("-3 to 11: " + f);

}

}

// 5.13 Random from Set

import java.util.Random;

public class RandomFromSet {

public static void main(String[] args) {

Random rand = new Random();

int[] setA = {2, 4, 6, 8, 10};

int[] setB = {3, 5, 7, 9, 11};

int[] setC = {6, 10, 14, 18, 22};

System.out.println("Set A: " + setA[rand.nextInt(setA.length)]);

System.out.println("Set B: " + setB[rand.nextInt(setB.length)]);

System.out.println("Set C: " + setC[rand.nextInt(setC.length)]);

}

}