**Assignment-3**

**Chapter-5**

**Review Questions**

1. Declare two variables named balance and rate.

* let balance;  
  let rate;

1. Declare a variable named inventor and assign the text “Franklin” to it.

* let inventor = “Franklin”;

1. After a computer executes the following JavaScript code, variable a will be of what data type?   
    var a = false;

* boolean

1. After a computer executes the following JavaScript code, variable b will be of what data type?   
    var b = “true”;

* String

1. After a computer executes the following JavaScript code, variable c will be of what data type?   
    var c = 15;

* number

1. After a computer executes the following JavaScript code, variable e will be of what data type and hold what value?   
    var c = 15;  
    var d = -2.17;

var e = c + d;

* number and 12.83

1. After a computer executes the following JavaScript code, variable h will be of what data type and hold what value?   
    var f = “Her name is ”;  
    var g = “Isabella”;

var h = f + g;

* String and “Her name is Isabella”

1. After a computer executes the following JavaScript code, variable k will be of what data type?

var i = document.getElementById(‘number1’).value;

var j = document.getElementById(‘number2’).value;  
 var k = i + j;

* String

1. After a computer executes the following JavaScript code, variable p will be of what data type?   
    var m = parseInt(document.getElementById(‘number’).value);  
    var n = parseFloat(document.getElementById(‘number’).value);  
    var p = m + n;

* number

1. After a computer executes the following JavaScript code, variable r will be of what data type and hold what value?  
    var c = 15;  
    var r = “You found “ + c + “ coins.”;

* String and “You found 15 coins.”

1. Write a JavaScript statement to calculate the amount of energy released during a nuclear reaction. In other words, translate into JavaScript. Assume that the variables and already exist and each holds a value. When writing your answer, be sure to declare and the variable names given in the equation above.

* let E;  
  E = m \* Math.pow(c, 2);

1. The semi-perimeter, , of a triangle with side lengths , , and is given by the formula . Translate this formula into JavaScript. Assume that the variables , , and already exist and each holds a value. When writing your answer, be sure to declare and use the variable names given in the equation above.

* let s;  
  s = (a + b + c) / 2;

1. Translate into JavaScript. Assume that the variables , , and already exist and each holds a value. When writing your answer, be sure to declare and use the variable names given in the equation above.

* let r;  
  r = 2 \* k + (6 - n) / 3 \* Math.pow(p, 2);

1. Rewrite the JavaScript statement:  
    z += x - 3 \* y;  
   So that it doesn’t use the += operator.

* z = z + x - 3 \* y;

1. Rewrite the JavaScript statement:  
    b \*= q - s;  
   So that it doesn’t use the \*= operator. Hint: pay close attention to operator precedence.

* b = b \* (q - s);

**Assignments**

1. Write a defining table and a JavaScript program to compute and output the volume of a tin can. Hint: use the formula and JavaScript code given in this chapter to compute the volume of a cylinder. Your program should correctly handle real numbers.

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| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| * Radius of a can * Height of a can |  | Volume of a tin can |

let radius;

let height;

let volume;

volume = Math.PI \* Math.pow(parseFloat(radius), 2) \* parseFloat(height);

1. Write a defining table and a JavaScript program that asks a user for a volume in quarts and then converts that value into liters. Your program should correctly handle real numbers such as 7.54.

|  |  |  |
| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| volume in quarts | divide the volume in quarts by 1.057 | volume in liters |

let quartsV;

let litersV;

const qtol = 1.057;

literV = parseFloat(quartsV) / qtol;

1. Write a defining table and a JavaScript program that asks a user for a distance in meters and then converts that value into miles. Your program should correctly handle real numbers.

|  |  |  |
| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| distance in meters | divide the distance in meters by 1609.344 | distance in miles |

let metersD;

let milesD;

const mtom = 1609.344;

milesD = parseFloat(metersD) / mtom;

1. A teacher frequently divides her class into teams. Write a defining table and a program that allows her to enter the number of students in her class and the number of teams she wants. The number of members on each team must be as balanced as possible. In other words, if not all of the teams can have the same number of members then some of the teams will have only one more member that the other teams. Your program must output a phrase that tells the teacher how to divide her class into teams. For example, if the teacher entered 27 class members and 8 teams, your program must output “3 teams with 4 members and 5 teams with 3 members”. Your program must list the larger teams first.

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| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| * number of students * number of teams | * divide number of students in number of teams to get number of students in a team * remainder is the number of teams with one more member * subtract remainder from number of teams to get number of teams with rest team | The number of members on each team |

let totalNumberOfStudents;

let totalNumberOfTeams;

let output;

let numberOfStudents;

let numberOfStudents1;

let numberOfTeams;

let numberOfTeams1;

numberOfStudents = totalNumberOfStudents / totalNumberOfTeams;

numberOfStudents1 = numberOfStudents + 1;

numberOfTeams1 = totalNumberOfStudents % totalNumberOfTeams;

numberOfTeams = totalNumberOfTeams - numberOfTeams1;

output = numberOfTeams1 + “ teams with ” +numberOfStudents1 + “ and ” + numberOfTeams + “ teams with ” + numberOfStudents + “members.”;

1. Write a defining table and a JavaScript program to compute the mileage of a vehicle. Your program should allow the user to enter the beginning and ending odometer readings and the number of gallons of gasoline used and should output the mileage in miles per gallon. Your program should correctly handle real numbers.

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| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| * beginning * ending * numberOfGallons |  | mileage |

let beginning;

let ending;

let numberOfGallons;

let mileage;

mileage = (parseFloat(ending) - parseFloat(beginning)) / parseFloat(numberOfGallons);

1. When you exercise to strengthen your heart, you should maintain your heart rate within a range. To find that range, subtract your age from 220. This difference is your maximum heart rate per minute. Your heart simply will not beat faster than this maximum (220 - age). When exercising to strengthen your heart, you should keep your heart rate between 65% and 85% of your heart’s maximum. Write a defining table and a JavaScript program that asks for a person’s age and computes and outputs the slowest and fastest rates necessary to strengthen his heart.

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| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| * age * const 220 | * maxHeartRate = 220 - age * slowestRate = maxHeartRate \* 65% * fastestRate = maxHeartRate \* 85% | * Maximum Heart Rate * Slowest Heart Rate * Fastest Heart Rate |

let age;

const n = 220;

let maxHeartRate;

let slowestHeartRate;

let fastestHeartRate;

maxHeartRate = n - age;

slowestHeartRate = (maxHeartRate \* 65) / 100;

fastestHeartRate = (maxHeartRate \* 85) / 100;

1. Write a defining table and a JavaScript program to compute and output an employee’s after tax pay. Your program will read from the keyboard the number of regular hours that an employee worked and that employee’s wage, and then compute that employee’s after tax pay. Tax is 15% of the employee’s gross pay. Your program should correctly handle real numbers.

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| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| * regular hours * wage * tax | * multiply regular hours to wage * calculate tax * compute after tax pay | Wage after tax pay |

let regularHours;

let wage;

const tax = 0.15;

let afterTaxPay;

let totalGross;

totalGross = regularHours \* wage;

afterTaxPay = totalGross - totalGross \* tax;

1. The length of a cable can be approximated with this formula:  
      
   where is the length of the cable, is the distance that the cable must span, and is the distance the cable will sag or dip. Write a defining table and a program that allows a user to enter the distance a cable must span and the distance the cable will sag. Your program must compute and output the length of the cable.

|  |  |  |
| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| * Distance of span * Distance of sag or dip |  | Length of a cable |

let s;

let d;

let L;

L = s + (8 \* Math.pow(d, 2)) / (3 \* s);

1. The size of a car tire in the United States is represented with three numbers like this:  
   205/60R 15. The first number is the width of the tire in millimeters. The second number is the aspect ratio. The third number is the diameter in inches of the wheel that the tire fits. Write a defining table and a program that reads from the keyboard those three numbers for a tire and computes and outputs the volume of space inside that tire. The volume of space inside a tire can be approximated with this formula:  
      
   where v is the volume in cubic centimeters, w is the width of the tire in millimeters, a is the aspect ratio of the tire, and d is the diameter of the wheel in inches.

|  |  |  |
| --- | --- | --- |
| **Input** | **Processing** | **Output** |
| * Width * Aspect ratio * Diameter |  | The volume of a space inside a tire |

let width;

let aspectRatio;

let diameter;

let volume;

Volume = (Math.PI \* width \* (Math.pow(width, 2) \* Math.pow(aspectRatio, 2) + 2540 \* width \* aspect \* diameter)) / 10000000;