**JavaScript Operators and Expressions**

**Review: the Date Object**

* What is an *object*?
* What is the *Date* object?
* What is a *constructor* function?
* What is the purpose of the Date constructor?

var today = new Date();  
alert(today);

var independenceDay = new Date(“July 4, 2017”);  
alert(independenceDay.getFullYear());

var timeRemaining = independenceDay – today;  
var daysRemaining = timeRemaining / 1000 / 60 /60 / 24;  
alert(daysRemaining);  
  
In the code above:

* Which Date object is created using the default constructor? What date and time is it set to?
* What does getFullYear return?
* Can you change the date or time that is already stored in a Date object? If so, how?
* What are the units for timeRemaining (it’s measured in what units)?

**JavaScript Operators**

* JavaScript has all the math operators you know: +, -, /, \* and one you might not: % (modulus)  
    
  var remainder = 8 % 3;  
  document.writeln(remainder);
* There are increment and decrement operators
  + postfix: x++, x--
  + prefix: ++x, --x  
      
    var count = 1;  
    count++  
    document.writeln();  
    document.writeln(count);  
    document.writeln(count++);  
    document.writeln(count);  
    document.writeln(++count);  
    document.writeln(count);
* Combined assignment and math operators  
    
  var num = 4;  
  num += 2;  
  document.writeln(num);  
  num -= 3;  
  document.writeln(num);  
  num \*= 10;  
  document.writeln(num);  
  num /= 5;  
  document.writeln(num);  
  num %= 2;  
  document.writeln(num);
* Range of numbers in JavaScript   
  (from <https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Number>)   
    
  var biggestNum = Number.MAX\_VALUE;   
  var smallestNum = Number.MIN\_VALUE;   
  var infiniteNum = Number.POSITIVE\_INFINITY;   
  var negInfiniteNum = Number.NEGATIVE\_INFINITY;   
  var biggestInt = 9007199254740991;   
  var smallestInt = -9007199254740991;
* Infinity  
  isFinite(n)
* Not a number  
  isNaN(n)
* Number of decimals displayed  
  toFixed(n)  
  + How is this different than rounding?  
    num = Math.round(n)

**The JavaScript Math Object**

* A predefined object that you can use without first using the new operator to instantiate (create) it.
* Methods in the Math object:  
  (from <https://www.w3schools.com/js/js_math.asp>)
  + abs(x) Returns the absolute value of x
  + acos(x) Returns the arccosine of x, in radians
  + asin(x) Returns the arcsine of x, in radians
  + atan(x) Returns the arctangent of x as a numeric value between -PI/2 and PI/2 radians
  + atan2(y, x) Returns the arctangent of the quotient of its arguments
  + ceil(x) Returns the value of x rounded up to its nearest integer
  + cos(x) Returns the cosine of x (x is in radians)
  + exp(x) Returns the value of Ex
  + floor(x) Returns the value of x rounded down to its nearest integer
  + log(x) Returns the natural logarithm (base E) of x
  + max(x, y, z, ..., n) Returns the number with the highest value
  + min(x, y, z, ..., n) Returns the number with the lowest value
  + pow(x, y) Returns the value of x to the power of y
  + random() Returns a random number between 0 and 1
  + round(x) Returns the value of x rounded to its nearest integer
  + sin(x) Returns the sine of x (x is in radians)
  + sqrt(x) Returns the square root of x
  + tan(x) Returns the tangent of an angle
* Constants in the Math object (properties):  
  (from <https://www.w3schools.com/js/js_math.asp>)
  + Math.E        // returns Euler's number
  + Math.PI       // returns PI
  + Math.SQRT2    // returns the square root of 2
  + Math.SQRT1\_2  // returns the square root of ½
  + Math.LN2      // returns the natural logarithm of 2
  + Math.LN10     // returns the natural logarithm of 10
  + Math.LOG2E    // returns base 2 logarithm of E
  + Math.LOG10E   // returns base 10 logarithm of E