# OBJECTIVE:

* To practice converting data from decimal to binary and hexadecimal systems.

# REFERENCE:

* Mazidi and Naimi “The AVR Microcontroller and Embedded Systems,” Chapter 0.

# MATERIAL:

* Microsoft Windows Calculator

# ACTIVITY 1

Perform the following conversions and verify your results using Windows Calculator. The calculator is in the Accessories folder of Windows. Select the *Programmer* calculator.

|  |  |  |
| --- | --- | --- |
| Base-10 | Base-2 | Base-16 |
| 63 | **111111** | **3F** |
| 256 | **100000000** | **100** |
| 10 | **1010** | **A** |
| 512 | **1000000000** | **200** |
| 255 | **11111111** | **FF** |

|  |  |  |
| --- | --- | --- |
| Base-2 | Base-16 | Base-10 |
| 11010 | **1A** | **26** |
| 10000 | **10** | **16** |
| 11110 | **1E** | **30** |
| 101010 | **2A** | **42** |
| 1111 | **F** | **15** |

|  |  |  |
| --- | --- | --- |
| Base-16 | Base-2 | Base-10 |
| 3BC | **1111001112** | **956** |
| 10A | **1000010102** | **266** |
| 20 | **1000002** | **32** |
| FFF | **111111111112** | **4095** |
| FA | **111111111112** | **250** |
| BAD | **101110101101** | **2989** |

1. Give the highest single digit for each of the number systems: decimal, binary, and hex.
2. **Decimal: 9**
3. **Binary: 1**
4. **Hex: f**
5. Which of the following cannot be a number in base-2? Give the reason.

(a) 11001 **(b) 113** (c) 10001

**Por que tiene el numero 3, y para tener ese numero tendriamos que usar como minimo base 4.**

1. What is the highest 8-bit number?

(a) In binary: **255** **(11111111)**

(b) In hex: **4294967295** **(FFFFFFFF**)

1. What is the highest 16-bit number?

(a) In binary: **65535 (1111111111111111)**

(b) In hex: **18446744073709552000 (FFFFFFFFFFFFFFFF)**

1. Convert binary 100000 to decimal and hex.

(a) Decimal: **32**

(b) Hex: **20**

1. Convert hex number BAAD to binary and decimal.

(a) Binary: **1011101010101101**

(b) Decimal: **47789**