# CXCC 104 – Math Lesson 1

### Hexadecimal

1. Complete the empty cells in the conversion table:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dec | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Hex | 0x0 | 0x1 | 0x2 |  |  |  |  |  | 0x8 | 0x9 |
|  |  |  |  |  |  |  |  |  |  |  |
| Dec | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| Hex | 0xA | 0xB |  | 0xD |  | 0xF | 0x10 | 0x11 | 0x12 |  |
|  |  |  |  |  |  |  |  |  |  |  |
| Dec | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| Hex |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| Dec |  |  | 32 |  |  |  |  |  |  |  |
| Hex | 0x1E |  |  |  |  |  |  |  |  |  |

1. Complete the following hexadecimal sequences:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| a) | 0x54 | 0x55 | 0x56 |  |  |  |  |
|  |  |  |  |  |  |  |  |
| b) | 0x9A | 0x9B | 0x9C |  |  |  |  |
|  |  |  |  |  |  |  |  |
| c) | 0x74 | 0x76 | 0x78 |  |  |  |  |
|  |  |  |  |  |  |  |  |
| d) | 0xA7 | 0xA8 | 0xA9 |  |  |  |  |
|  |  |  |  |  |  |  |  |
| e\*) | 0x2048 | 0x204C | 0x2050 |  |  |  |  |
|  |  |  |  |  |  |  |  |

1. (\*Harder) In the row below each of the cells in question (b) use the calculator to convert to decimal.

### Binary

Remember 24 = 2 x 2 x 2 x 2

= 16

24 is “two to the power of 4” and is sometimes seen in computers as 2^4

(^ is “carat”)

20 we take in mathematics to be 1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Power | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 |
| Hex | 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 |

1. Complete the empty cells in the conversion table:

|  |  |  |
| --- | --- | --- |
| Binary | Decimal | Hexadecimal |
| 0000 | 0 | 0x0 |
| 0001 | 1 | 0x1 |
| 0010 | 2 | 0x2 |
| 0011 | 3 | 0x3 |
|  | 4 |  |
| 0101 |  |  |
| 0110 |  |  |
|  | 7 |  |
| 1000 |  |  |
| 1001 | 9 |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  | 16 |  |

1. Complete the following binary to decimal conversion table:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 | Convert to decimal |
| a) | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 4+2+1=7 |
| b) | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 32+8+2= |
| c) | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |  |
| d) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | hint 28 – 1 |
| e) | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |  |
| f) | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |  |
| g) |  |  |  |  |  |  |  |  | 156 = 128 + 16 + |
| h) |  |  |  |  |  |  |  |  | 200 |

1. Beside each row in (e), write the hexadecimal equivalent
2. Complete the following binary to hexadecimal conversion table:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 8 | 4 | 2 | 1 | 8 | 4 | 2 | 1 | Convert to Hexadecimal |
| a) | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0x0F |
| b) | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |  |
| c) | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |  |
| d) |  |  |  |  |  |  |  |  | 0x7E |
| e) |  |  |  |  |  |  |  |  | 0x3A |