1a. 0xFEED = -0x113 = -273

* 0xFEED = 1111 1110 1110 1101
* Most significant bit is 1, so it is a negative number
* 2's complement: 0000 0001 0010 0011
* decimal: 12^4 + 22^1 + 3\*2^0 = 16 + 4 + 1 = 21
* Add negative sign: -21
* 0xFEED = -273

1b. 0x4BAF = 19375

* 0x4BAF = 0100 1011 1010 1111
* Most significant bit is 0, so positive number
* Decimal: 416^3 + 1116^2 + 1016^1 + 1516^0 = 16384 + 2816 + 160 + 15 = 19375
* 0x4BAF = 19375

2a. -14522 = 0xFFFFC5DA

* 14522 : 0011 1001 0010 1010
* 2's complement: 1100 0110 1101 0110
* Hexadecimal: 0xC5DA
* Add the sign: 0xFFFFC5DA

2b. 12524 = 0x00003064

* 12524 = 0x3064
* Add zeros to make 32 bits: 0x00003064

3a. -0.375 = 1 10000010 10000000000000000000000

* Sign bit is 1, since number is negative
* 0.375 = 0.011
* 0.011 → 1.1
* Exponent is 2 + 127 = 129 = 10000001
* Fraction field is the 23 bits after the leading 1: 10000000000000000000000
* Therefore, -0.375 = 1 10000001 10000000000000000000000

3b. 1.125 = 0 01111110 00100000000000000000000

* Sign bit is 0, since number is positive
* 0.125 = 0.001
* 0.001 → 1.001
* The exponent is 2 + 126 = 128 = 01111110
* The fraction field is the 23 bits after the leading 1: 00100000000000000000000
* 1.125 = 0 01111110 00100000000000000000000

4a. 3EE00000 = 1.1875

* Sign bit is 0, since number is positive
* The exponent is 0x3E - 0x7F = 1 = 2^1 = 2
* The fraction field is 1.75 in binary: 0011 0000 0000 0000 0000 000

4b. BEA00000 = -0.000038623809814453125

* negative number because the sign is 1.
* 0xEA = 11101010
* Exponent = 0xEA - 127 = -19
* The fraction field represents the binary fraction 1.10100000000000000000000
* The decimal value of this fraction is:
  + 1 x 2^0 + 1 x 2^-1 + 0 x 2^-2 + 1 x 2^-3 + 0 x 2^-4 + 0 x 2^-5 + 0 x 2^-6 + 0 x 2^-7 + 0 x 2^-8 + 0 x 2^-9 + 0 x 2^-10 + 0 x 2^-11 + 0 x 2^-12 + 0 x 2^-13 + 0 x 2^-14 + 0 x 2^-15 + 0 x 2^-16 + 0 x 2^-17 + 0 x 2^-18 + 0 x 2^-19 + 0 x 2^-20 + 0 x 2^-21 + 0 x 2^-22 + 0 x 2^-23 + 0 x 2^-24 + 0 x 2^-25 + 0 x 2^-26 + 0 x 2^-27 + 0 x 2^-28 + 0 x 2^-29 + 0 x 2^-30 + 0 x 2^-31
* = 1.640625
* Therefore, 0xBEA00000 = -1 x 2^-19 x 1.640625 = -0.000038623809814453125

5. “Comets forever!” = 0x00400000: 43 6F 6D 65 74 73 20 66 6F 72 65 76 65 72 21 00

* String is terminated by a null character, which is represented by 0x00
* Convert each character to its ASCII code
* Store codes in consecutive memory locations starting at 0x00400000
* Add a null character at the end of the string to indicate the end of the string