Name: _____

MATH 308
Fall 2022
HW 15: Due 11/10

"I memorized the hexadecimal times tables when I was 14 writing machine code, okay? Ask me what 9 times F is. It's fleventy-five."
–Erlich Bachman, Silicon Valley

Problem 1. (10pt) Showing all your work, convert the following numbers to base-10:

(a) 9_9

(b) 121_3

(c) $5F01$

(d) 1001_{17}

Problem 2. (10pt) Showing all your work, convert the following base-10 numbers numbers in the given base b:

(a) 15, $b = 7$

(b) 25, $b = 4$

(c) 88, $b = 2$

(d) 1400, $b = 11$

Problem 3. (10pt) Showing all your work and without working in base-10, compute the following:

(a) $1001_2 + 1011_2$

(b) $101_2 - 11_2$

(c) $32_5 - 14_5$

(d) $1A \cdot 2B$

Problem 4. (10pt) Suppose you have integers represented in a computer written using only 4-bit binary with the first bit reserved for the sign (1 representing a negative). Using the 2's complement method to find all the representations of the negative integers, give a table of the possible integer values and their binary pattern.