1.1 Convert to hexadecimal and then to binary:
(a) 757.25_{10} (b) 123.17_{10} (c) 356.89_{10} (d) 1063.5_{10}

1.2 Convert to octal. Convert to hexadecimal. Then convert both of your answers to decimal, and verify that they are the same.
(a) 111010110001.011_2 (b) 10110011101.11_2

1.3 Convert to base 6: $3BA.25_{14}$ (do all of the arithmetic in decimal).

1.4 (a) Convert to hexadecimal: 1457.11_{10}. Round to two digits past the hexadecimal point.
(b) Convert your answer to binary, and then to octal.
(c) Devise a scheme for converting hexadecimal directly to base 4 and convert your answer to base 4.
(d) Convert to decimal: $DEC.A_{16}$.

1.5 Add, subtract, and multiply in binary:
(a) 1111 and 1010 (b) 110110 and 11101 (c) 100100 and 10110

1.6 Subtract in binary. Place a 1 over each column from which it was necessary to borrow.
(a) 11110100 − 1000111 (b) 1110110 − 111101 (c) 10110010 − 111101

1.7 Add the following numbers in binary using 2's complement to represent negative numbers. Use a word length of 6 bits (including sign) and indicate if an overflow occurs.
(a) $21 + 11$ (b) $(-14) + (-32)$ (c) $(-25) + 18$
(d) $(-12) + 13$ (e) $(-11) + (-21)$
Repeat (a), (c), (d), and (e) using 1's complement to represent negative numbers.

1.8 A computer has a word length of 8 bits (including sign). If 2's complement is used to represent negative numbers, what range of integers can be stored in the computer? If 1's complement is used? (Express your answers in decimal.)

1.9 Construct a table for 7-3-2-1 weighted code and write 3659 using this code.

1.10 Convert to hexadecimal and then to binary.
(a) 1305.375_{10} (b) 111.33_{10} (c) 301.12_{10} (d) 1644.875_{10}

1.11 Convert to octal. Convert to hexadecimal. Then convert both of your answers to decimal, and verify that they are the same.
(a) 101111010100.101_2 (b) 100001101111.01_2

1.12 (a) Convert to base 3: 375.54_8 (do all of the arithmetic in decimal).
(b) Convert to base 4: 384.74_{10}.
(c) Convert to base 9: $A52.A4_{11}$ (do all of the arithmetic in decimal).

1.13 Convert to hexadecimal and then to binary: 544.1_9.

1.14 Convert the decimal number 97.7_{10} into a number with exactly the same value represented in the following bases. The exact value requires an infinite repeating part in the fractional part of the number. Show the steps of your derivation.
(a) binary (b) octal (c) hexadecimal (d) base 3 (e) base 5

1.15 Devise a scheme for converting base 3 numbers directly to base 9. Use your method to convert the following number to base 9: 1110212.20211_3

1.16 Convert the following decimal numbers to octal and then to binary:
(a) $2983^{63}/_{64}$ (b) 93.70 (c) $1900^{31}/_{32}$ (d) 109.30

1.17 Add, subtract, and multiply in binary:
(a) 1111 and 1001 (b) 1101001 and 110110 (c) 110010 and 11101

1.18 Subtract in binary. Place a 1 over each column from which it was necessary to borrow.
(a) $10100100 - 01110011$ (b) $10010011 - 01011001$
(c) $11110011 - 10011110$

1.19 Divide in binary:
(a) $11101001 \div 101$ (b) $110000001 \div 1110$ (c) $1110010 \div 1001$
Check your answers by multiplying out in binary and adding the remainder.

1.20 Divide in binary:
(a) $10001101 \div 110$ (b) $110000011 \div 1011$ (c) $1110100 \div 1010$