1.21 Assume three digits are used to represent positive integers and also assume the following operations are correct. Determine the base of the numbers. Did any of the additions overflow?

(a) $654 + 013 = 000$

(b) $024 + 043 + 013 + 033 = 223$

(c) $024 + 043 + 013 + 033 = 201$

1.22 What is the lowest number of bits (digits) required in the binary number approximately equal to the decimal number 0.6117_{10} so that the binary number has the same or better precision?

1.23 Convert $0.363636\ldots_{10}$ to its exact equivalent base 8 number.

1.24 (a) Verify that a number in base b can be converted to base b^3 by partitioning the digits of the base b number into groups of three consecutive digits starting at the radix point and proceeding both left and right and converting each group into a base b^3 digit. (*Hint:* Represent the base b number using the power series expansion.)

(b) Verify that a number in base b^3 can be converted to base b by expanding each digit of the base b^3 number into three consecutive digits starting at the radix point and proceeding both left and right.

1.33 Repeat 1.7 for the following numbers:

(a) $(-10) + (-11)$ (b) $(-10) + (-6)$ (c) $(-8) + (-11)$
(d) $11 + 9$ (e) $(-11) + (-4)$

1.34 Because $A - B = A + (-B)$, the subtraction of signed numbers can be accomplished by adding the complement. Subtract each of the following pairs of 5-bit binary numbers by adding the complement of the subtrahend to the minuend. Indicate when an overflow occurs. Assume that negative numbers are represented in 1's complement. Then repeat using 2's complement.

(a)	(b)	(c)	(d)	(e)
01001	11010	10110	11011	11100
-11010	-11001	-01101	-00111	-10101

1.35 Work Problem 1.34 for the following pairs of numbers:

(a)	(b)	(c)	(d)
11010	01011	10001	10101
-10100	-11000	-01010	-11010