

Exercise 1.

Give the next four numbers in each of the following hex sequences.

1. $2A6; 2A7; 2A8; \dots$
2. $C997; C998; \dots$

Exercise 2.

1. Convert the following decimal numbers to binary, octal and hexadecimal.

48; 82; 172; 2654.

2. Convert the following numbers to decimal.

$10010_2; 1001011_2; 32_8; 467_8; 2CF_{16}; A2A_{16}$.

3. Convert the following numbers to octal, hexadecimal.

$1101101101_2; 11000101_2; 1100011_2; 10101_2$.

4. Convert the following numbers to hexadecimal.

$241_8; 645_8; 5432_8; 4326_8$.

5. Convert the following numbers to octal.

$2AF_{16}; 9AA_{16}; 3C_{16}; 49_{16}$.

Exercise 3. We consider a number N in radix- x system, defined by

$$N = 2 \cdot x^3 + 3 \cdot x^2 + 5 \cdot x + 2$$

1. Give the numerical representation of N in radix- x .
2. Show that N is a multiple of 21_x .
3. In the following, we assume that $x = 8$.
 - (a) Convert N to binary.
 - (b) Convert N to hexadecimal.

Exercise 4.

1. Use the Newton's Binomial Theorem to develop

$$(a + 1)^5.$$

2. Deduce the numerical representation of the fifth power of thirteen in the radix twelve representation.

Exercise 5.

1. Convert the following decimal numbers to binary, octal and hexadecimal.

$$234.25; 453.3125; 125.7125.$$

2. Convert the following numbers to decimal.

$$1001.011_2; 11101100.10011_2; 47.54_8; 4F.4_{16}.$$

3. Convert the following numbers to octal, hexadecimal.

$$1111.01_2; 11.0101_2.$$

4. Convert the following numbers to hexadecimal.

$$473.21_8; 36.5_8.$$

5. Convert the following numbers to octal.

$$2C.1_{16}; 3E.F_{16}.$$

Exercise 6. Find the radix x of the arithmetic equation

$$\frac{302_x}{20_x} = 12.1_x.$$

Exercise 7. Do the binary arithmetic.

1. $100111 + 1001.$
2. $11101 - 1101.$
3. $1101 \times 101.$
4. $100001 \div 1011.$