

# Exercises: Number Bases 2

## Exercises

1. (a) Find the ten's complement of:
  - i. 3201,
  - ii. 4312.
- (b) Use these to subtract the numbers from 4123.
- (c) Check your answers using ordinary subtraction or a calculator.
2. Use ten's complement to evaluate the following in denary:
  - (a)  $12345 - 5678$ ,
  - (b)  $5678 - 12345$ .
3. Use two's complement to evaluate the following in binary:
  - (a)  $01110011 - 01011001$
  - (b)  $01011001 - 01110011$
  - (c)  $01100111 - 00010111$
  - (d)  $00001011 - 00100110$
  - (e)  $00001101 - 00001110$

## Solutions

1. (a) Find the ten's complement of:
  - i. 3201: 6799,
  - ii. 4312: 5688.
- (b) Use these to subtract the numbers from 4123.
  - i.  $4123 + 6799 = 10922$ . Ignore the first 1, to get 922 (positive).
  - ii.  $4123 + 5688 = 9811$ : take the ten's complement to get  $0188 + 1 = 189$ , so the answer is  $-189$ .
- (c) Check your answers using ordinary subtraction or a calculator.
2. Use ten's complement to evaluate the following in denary:
  - (a)  $12345 - 5678$ : 6667,

(b)  $5678 - 12345: -6667$ .

3. Use two's complement to evaluate the following in binary:

(a)  $01110011 - 01011001 = 0001\ 1010$

(b)  $01011001 - 01110011 = -01\ 1010$

(c)  $01100111 - 00010111 = 0101\ 0000$

(d)  $00001011 - 00100110 = -0001\ 1011$

(e)  $00001101 - 00001110 = -1$