Exercise 1.1.4 - Factors and Multiples Solutions

1. What are the factors of:

a) 10

To find the factors of a number, we need to identify all whole numbers that divide the number exactly (with zero remainder).

Factors of 10:

- 1 (because 10 ÷ 1 = 10)
- 2 (because 10 ÷ 2 = 5)
- 5 (because 10 ÷ 5 = 2)
- 10 (because 10 ÷ 10 = 1)

Therefore, the factors of 10 are: 1, 2, 5, 10

b) 18

Factors of 18:

- 1 (because 18 ÷ 1 = 18)
- 2 (because 18 ÷ 2 = 9)
- 3 (because 18 ÷ 3 = 6)
- 6 (because 18 ÷ 6 = 3)
- 9 (because 18 ÷ 9 = 2)
- 18 (because 18 ÷ 18 = 1)

Therefore, the factors of 18 are: 1, 2, 3, 6, 9, 18

c) 24

Factors of 24:

- 1 (because 24 ÷ 1 = 24)
- 2 (because 24 ÷ 2 = 12)
- 3 (because 24 ÷ 3 = 8)
- 4 (because 24 ÷ 4 = 6)
- 6 (because 24 ÷ 6 = 4)
- 8 (because 24 ÷ 8 = 3)
- 12 (because 24 ÷ 12 = 2)
- 24 (because 24 ÷ 24 = 1)

Therefore, the factors of 24 are: 1, 2, 3, 4, 6, 8, 12, 24

2. Find the first 5 multiples of:

a) 5

Multiples of a number are found by multiplying that number by integers.
The first 5 multiples of 5 are:
1 × 5 = 5
2 × 5 = 10
3 × 5 = 15
4 × 5 = 20
5 × 5 = 25

Therefore, the first 5 multiples of 5 are: 5, 10, 15, 20, 25

b) 9

The first 5 multiples of 9 are:
1 × 9 = 9
2 × 9 = 18
3 × 9 = 27
4 × 9 = 36
5 × 9 = 45

Therefore, the first 5 multiples of 9 are: 9, 18, 27, 36, 45

c) 11

The first 5 multiples of 11 are:
1 × 11 = 11
2 × 11 = 22
3 × 11 = 33
4 × 11 = 44
5 × 11 = 55

Therefore, the first 5 multiples of 11 are: 11, 22, 33, 44, 55

3. Find the prime factors of the following and give your answer in index form.

a) 48

To find the prime factors, we divide the number by prime numbers until we reach 1:

48 ÷ 2 = 24
24 ÷ 2 = 12
12 ÷ 2 = 6
6 ÷ 2 = 3
3 ÷ 3 = 1

Therefore, $48 = 2 \times 2 \times 2 \times 2 \times 3 = 2^4 \times 3^1$

b) 50

To find the prime factors:

50 ÷ 2 = 25
25 ÷ 5 = 5
5 ÷ 5 = 1

Therefore, $50 = 2 \times 5 \times 5 = 2^1 \times 5^2$

c) 120

To find the prime factors:

120 ÷ 2 = 60
60 ÷ 2 = 30
30 ÷ 2 = 15
15 ÷ 3 = 5
5 ÷ 5 = 1

Therefore, $120 = 2 \times 2 \times 2 \times 3 \times 5 = 2^3 \times 3^1 \times 5^1$