



## Multiples, factors and primes

- Finding lowest common multiples
- Finding highest common factors
- Finding prime factors

Keywords

You should know

### explanation 1

- 1 a** Write the first six multiples of 8.  
**b** 112 is a multiple of 8. Write the next two multiples of 8.
- 2 a** Write the first six multiples of 2.  
**b** Write the first six multiples of 3.  
**c** Which of the numbers are common multiples of 2 and 3?  
**d** What is the lowest common multiple of 2 and 3?
- 3** Find the lowest common multiple of each set of numbers.
- |                 |                  |                    |                   |
|-----------------|------------------|--------------------|-------------------|
| <b>a</b> 2, 5   | <b>b</b> 4, 14   | <b>c</b> 6, 9      | <b>d</b> 3, 7     |
| <b>e</b> 12, 15 | <b>f</b> 6, 21   | <b>g</b> 14, 8     | <b>h</b> 9, 24    |
| <b>i</b> 10, 18 | <b>j</b> 3, 5, 6 | <b>k</b> 4, 10, 12 | <b>l</b> 5, 8, 10 |
- 4 a** The lowest common multiple of two numbers is 24.  
What could these numbers be?  
**b** Find three numbers whose lowest common multiple is 36.

### explanation 2

- 5** Write all the factors of these numbers.
- |             |             |             |             |
|-------------|-------------|-------------|-------------|
| <b>a</b> 26 | <b>b</b> 32 | <b>c</b> 27 | <b>d</b> 40 |
| <b>e</b> 48 | <b>f</b> 35 | <b>g</b> 56 | <b>h</b> 90 |

**6 a** Is 3 a factor of these numbers?

**i** 36

**ii** 56

**iii** 141

**iv** 285

**b** Explain how you can tell if 3 is a factor of a large number.

**7 a** Is 9 a factor of these numbers?

**i** 54

**ii** 72

**iii** 65

**iv** 216

**b** How can you tell if 9 is a factor of a large number?

**8 a** Is 4 a factor of these numbers?

**i** 34

**ii** 28

**iii** 132

**iv** 228

**b** How can you tell if 4 is a factor of a large number?

**9 a** Write down all the factors of 36.

**b** Write down all the factors of 64.

**c** Write down the factors that are common to 36 and 64.

**d** What is the highest common factor of 36 and 64?

**10** Find the highest common factor of each set of numbers.

**a** 16, 24

**b** 27, 63

**c** 40, 52

**d** 28, 42

**e** 70, 84

**f** 72, 96

**g** 93, 108

**h** 68, 96

**i** 26, 65

**j** 45, 63, 72

**k** 52, 65, 91

**l** 64, 84, 104

### explanation 3

**11 a** Write the first ten prime numbers.

**b** Explain why there is only one even prime number.

**12** Which of these numbers are prime?

- |              |              |              |              |
|--------------|--------------|--------------|--------------|
| <b>a</b> 13  | <b>b</b> 23  | <b>c</b> 31  | <b>d</b> 39  |
| <b>e</b> 53  | <b>f</b> 78  | <b>g</b> 87  | <b>h</b> 91  |
| <b>i</b> 121 | <b>j</b> 147 | <b>k</b> 151 | <b>l</b> 173 |

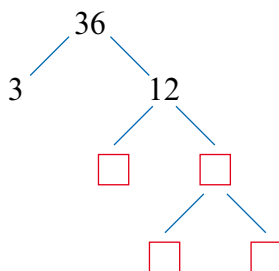
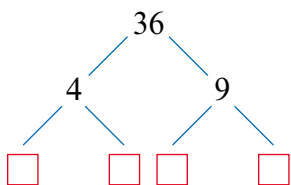
**13** Write three 2-digit prime numbers which, when their digits are reversed, are also prime.

**14** Find two prime numbers with a sum of 46 and a difference of 12.

**15** Is 2011 a prime number? Use a calculator to help.

#### explanation 4

**16 a** Copy and complete these factor trees.



**b** Write 36 as a product of its prime factors.

$$36 = \square \times \square \times \square \times \square$$

$$36 = \square \times \square$$

**c** Does your answer to **b** depend on the factors you use to start the factor tree?

**17** Use a factor tree to write each number as a product of its prime factors.

- |              |              |              |              |
|--------------|--------------|--------------|--------------|
| <b>a</b> 24  | <b>b</b> 45  | <b>c</b> 16  | <b>d</b> 60  |
| <b>e</b> 72  | <b>f</b> 100 | <b>g</b> 81  | <b>h</b> 48  |
| <b>i</b> 124 | <b>j</b> 250 | <b>k</b> 400 | <b>l</b> 550 |

**explanation 5**

**18 a** Copy and complete these tables to find the prime factors.

**i**

2	84
	42
3	
	1

**ii**

2	180
2	
	45
	1

**b** Use your answers to part **a** to write each number as a product of prime factors.

**i**  $84 = \square \times \square \times \square \times \square$   
 $= \square \times \square \times \square$

**ii**  $180 = \square \times \square \times \square \times \square \times \square$   
 $= \square \times \square \times \square$

**19** Use the dividing method to write each of the following numbers as a product of prime factors.

**a** 12

**b** 36

**c** 70

**d** 81

**e** 120

**f** 275

**g** 105

**h** 455

**20** A writing set contains one pen and one pencil.

The pens come in boxes of 10 and the pencils come in boxes of 12.

How many complete sets can be made up from these boxes?

**a** 1 box of pens and 1 box of pencils

**b** 2 boxes of pens and 3 boxes of pencils

**c** 3 boxes of pens and 2 boxes of pencils