

TARGET To identify common factors and prime numbers.

Examples

Factors of 16 1, 2, 4, 8, 16

Factors of 40 1, 2, 4, 5, 8, 10, 20, 40

Common factors 1, 2, 4, 8

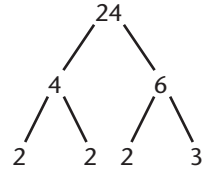
Highest common factor 8

Prime numbers – 2 factors only e.g. 23

Composite numbers – more than 2 factors e.g. 24

Prime factors can be found by using a factor tree.

Prime factors of 24: $2 \times 2 \times 2 \times 3$



A

Find all the factors of each number. The number of factors is shown in brackets.

- | | |
|----------|------------|
| 1 12 (6) | 7 55 (4) |
| 2 28 (6) | 8 18 (6) |
| 3 25 (3) | 9 100 (9) |
| 4 30 (8) | 10 54 (8) |
| 5 32 (6) | 11 49 (3) |
| 6 27 (4) | 12 60 (12) |

Write down the number(s) in each group which are not prime numbers.

- 13 7 8 9 10
 14 17 18 19 20
 15 23 24 25 26
 16 31 32 33 34
 17 46 47 48 49
 18 56 57 58 59
 19 70 71 72 73
 20 88 89 90 91

- 21 The first five prime numbers are:
 2, 3, 5, 7, 11
 Write down the next ten prime numbers.

B

For each pair of numbers find:

- a) the common factors
 b) the highest common factor.

- | | |
|----------|-----------|
| 1 6, 15 | 7 36, 96 |
| 2 16, 24 | 8 40, 100 |
| 3 45, 60 | 9 28, 70 |
| 4 12, 18 | 10 32, 72 |
| 5 8, 12 | 11 18, 30 |
| 6 27, 36 | 12 24, 60 |

- 13 List all the prime numbers below 100. There are 25.

Explain why these numbers are composite numbers.

- | | |
|--------|---------|
| 14 738 | 18 1990 |
| 15 273 | 19 177 |
| 16 415 | 20 301 |
| 17 119 | 21 143 |

Find all the prime factors of:

- | | |
|-------|--------|
| 22 50 | 26 52 |
| 23 36 | 27 132 |
| 24 28 | 28 90 |
| 25 60 | 29 72. |

C

For each group of numbers find:

- a) the common factors
 b) the highest common factor.

- | |
|-----------------|
| 1 20, 32, 60 |
| 2 225, 450, 600 |
| 3 32, 64, 80 |
| 4 9, 27, 33 |
| 5 56, 96, 120 |
| 6 36, 54, 108 |
| 7 30, 48, 84 |
| 8 45, 72, 135 |

Explain why these numbers are composite numbers.

- | | |
|--------|---------|
| 9 253 | 11 1923 |
| 10 221 | 12 361 |

Find all the prime numbers between:

- | |
|-----------------|
| 13 100 and 110 |
| 14 130 and 140 |
| 15 150 and 160 |
| 16 190 and 200. |

Find the prime factors of:

- | | |
|--------|---------|
| 17 200 | 21 182 |
| 18 144 | 22 375 |
| 19 162 | 23 252 |
| 20 264 | 24 440. |

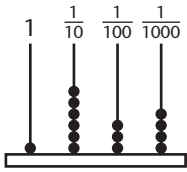
Mastery: True or False?

'The highest common factor of any two numbers will **never** be a prime number.'

Write statements to prove or disprove this statement.

TARGET To identify the value of each digit to three decimal places.

The value of a digit depends upon its position in the number.



$$1 + \frac{6}{10} + \frac{3}{100} + \frac{4}{1000}$$

$$1 + 0.6 + 0.03 + 0.004$$

$$1 \frac{634}{1000} = 1.634$$

Give the value of the 5 in each number.

$$0.513 \rightarrow \frac{5}{10}$$

$$1.359 \rightarrow \frac{5}{100}$$

$$5.247 \rightarrow 5$$

$$0.085 \rightarrow \frac{5}{1000}$$

A

Write as decimals.

- | | |
|----------------------|----------------------|
| 1 $\frac{9}{10}$ | 7 $\frac{1}{4}$ |
| 2 $\frac{27}{100}$ | 8 $\frac{89}{100}$ |
| 3 $\frac{1}{2}$ | 9 $\frac{3}{10}$ |
| 4 $\frac{3}{100}$ | 10 $\frac{11}{1000}$ |
| 5 $\frac{7}{10}$ | 11 $\frac{3}{4}$ |
| 6 $\frac{135}{1000}$ | 12 $\frac{8}{1000}$ |

Write as fractions.

- | | |
|----------|----------|
| 13 0.25 | 19 0.81 |
| 14 0.1 | 20 0.4 |
| 15 0.634 | 21 0.562 |
| 16 0.98 | 22 0.07 |
| 17 0.02 | 23 0.19 |
| 18 0.309 | 24 0.057 |

Give the value of the underlined figure.

- | | |
|-------------------|-------------------|
| 25 13. <u>5</u> | 31 6. <u>27</u> |
| 26 8.1 <u>6</u> | 32 <u>11</u> .036 |
| 27 <u>2</u> .4 | 33 37. <u>6</u> |
| 28 0. <u>3</u> 28 | 34 0. <u>9</u> 4 |
| 29 5. <u>0</u> 9 | 35 4.5 <u>8</u> 5 |
| 30 <u>29</u> .7 | 36 <u>42</u> .81 |

B

Write as decimals.

- | | |
|------------------------|------------------------|
| 1 $4 \frac{713}{1000}$ | 7 $\frac{41}{1000}$ |
| 2 $7 \frac{28}{1000}$ | 8 $9 \frac{485}{1000}$ |
| 3 $\frac{36}{100}$ | 9 $13 \frac{19}{100}$ |
| 4 $2 \frac{7}{1000}$ | 10 $5 \frac{6}{1000}$ |
| 5 $1 \frac{539}{1000}$ | 11 $\frac{147}{1000}$ |
| 6 $8 \frac{98}{100}$ | 12 $6 \frac{53}{1000}$ |

Write as mixed numbers.

- | | |
|----------|-----------|
| 13 3.839 | 19 1.082 |
| 14 8.075 | 20 27.7 |
| 15 12.42 | 21 5.643 |
| 16 6.901 | 22 3.02 |
| 17 4.06 | 23 16.317 |
| 18 9.548 | 24 2.49 |

Give the value of the underlined figure.

- | | |
|--------------------|--------------------|
| 25 4.9 <u>2</u> 3 | 31 43.2 <u>9</u> 6 |
| 26 0.1 <u>6</u> 5 | 32 6.0 <u>3</u> 8 |
| 27 <u>5</u> 9.014 | 33 21.4 <u>5</u> |
| 28 17. <u>8</u> 07 | 34 9. <u>7</u> 41 |
| 29 32.6 <u>8</u> | 35 <u>4</u> .309 |
| 30 5.0 <u>7</u> 2 | 36 8.5 <u>6</u> 3 |

C

Copy and complete.

- | |
|------------------------------|
| 1 $1.392 + 0.04 = \square$ |
| 2 $4.79 + 0.035 = \square$ |
| 3 $0.224 + 0.28 = \square$ |
| 4 $0.581 + \square = 1.181$ |
| 5 $6.953 + \square = 7.001$ |
| 6 $5.437 + \square = 5.54$ |
| 7 $2.356 - 0.09 = \square$ |
| 8 $0.844 - 0.45 = \square$ |
| 9 $9.862 - 0.106 = \square$ |
| 10 $8.295 - \square = 7.895$ |
| 11 $3.003 - \square = 2.98$ |
| 12 $0.108 - \square = 0.099$ |

Give the answer as a decimal.

- | |
|------------------------------|
| 13 $\frac{43}{100} + 0.209$ |
| 14 $\frac{1}{4} + 0.277$ |
| 15 $\frac{187}{1000} + 0.65$ |
| 16 $\frac{3}{4} - 0.075$ |
| 17 $\frac{1}{5} - 0.099$ |
| 18 $\frac{1}{2} - 0.125$ |

Mastery

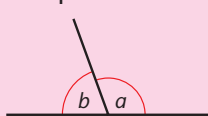
What is missing from this number sentence?

$$5.612 = 5 + 0.6 + 0.002$$

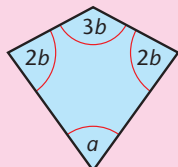
B

Write a formula for the size of angle a in each shape.

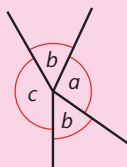
1



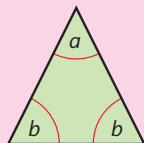
2



3



4



Draw and label a shape whose perimeter is given by each formula.

5 a quadrilateral $p = 2x + y + z$ (cm)6 a hexagon $p = 6a$ (cm)7 a pentagon $p = 3k + l + m$ (cm)8 a triangle $p = 3e$ (cm)

The area of a triangle is half the length of the base times the height.

$$\text{or } a = \frac{bh}{2} \text{ (cm}^2\text{)}$$

9 Use the above formula to find the area of a triangle with:

a) base 9 cm, height 7 cm

b) base 6 cm, height 2.5 cm

10 1 gallon = 4.5 ℓ

Use the above formula to find the number of litres in:

a) 4 gallons b) 20 gallons

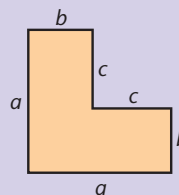
C

For each shape write a formula for:

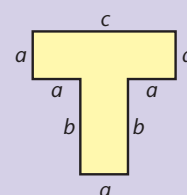
a) the perimeter

b) the area.

1



2



$$v = lwh \text{ (cm}^3\text{)}$$

Use the above formula for the volume of a cuboid with dimensions of:

3 length 5 cm, width 4 cm, height 1.5 cm

4 length 40 cm, width 25 cm, height 12 cm

$$\text{sum of angles} = 180(\text{sides} - 2)^\circ$$

Use the above formula to find the sum of the angles of a polygon with:

5 5 sides

6 7 sides

7 An electrician has a call out charge of £25 and he charges a further £50 for every hour worked. Write a formula for how much he would charge (c) for working h hours.8 A car begins a journey with a full tank of 40 litres of petrol. It uses one litre of petrol for every 10 miles travelled. Write a formula for the amount of petrol (p) in the tank after travelling m miles.9 There are 50 questions in a test. There are 2 marks for each question. Write a formula for the number of marks (m) scored by someone who:a) gets r questions rightb) gets w questions wrong.**Mastery**

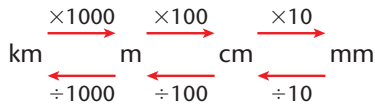
The formula for buying cakes at a bakery is: $35c + 20$

Where c = number of cakes and 20 is the price of the box to carry them home, what does the 35 mean?

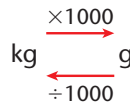
How much would it cost to buy 4 cakes and carry them home in a box?

TARGET To convert between standard units of length, mass and capacity.

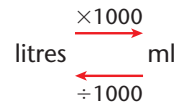
UNITS OF LENGTH



UNITS OF MASS



UNITS OF CAPACITY



A

Copy and complete.

- 1 5000 m = km
- 2 1800 m = km
- 3 3.5 km = m
- 4 2.9 km = m
- 5 640 cm = m
- 6 25 cm = m
- 7 0.48 m = cm
- 8 9.36 m = cm
- 9 2 mm = cm
- 10 71 mm = cm
- 11 54 cm = mm
- 12 0.8 cm = mm
- 13 0.6 kg = g
- 14 3.2 kg = g
- 15 970 g = kg
- 16 4050 g = kg
- 17 1.6 litres = ml
- 18 8.2 litres = ml
- 19 300 ml = litres
- 20 7900 ml = litres

Change to:

- | | |
|----------|--------------|
| miles | km |
| 21 40 km | 25 2 miles |
| 22 72 km | 26 30 miles |
| 23 12 km | 27 100 miles |
| 24 28 km | 28 11 miles |

B

Copy and complete.

- 1 2168 m = km
- 2 359 m = km
- 3 7.708 km = m
- 4 0.063 km = m
- 5 29 cm = m
- 6 580 cm = m
- 7 0.07 m = cm
- 8 4.11 m = cm
- 9 153 mm = m
- 10 8 mm = m
- 11 6.49 m = mm
- 12 0.072 m = mm
- 13 3.456 kg = g
- 14 0.002 kg = g
- 15 179 g = kg
- 16 3 g = kg
- 17 0.6 litres = ml
- 18 8.01 litres = ml
- 19 2400 ml = litres
- 20 75 ml = litres

Change to:

- | | |
|------------|---------------|
| miles | km |
| 21 36 km | 25 4.8 miles |
| 22 50 km | 26 62.5 miles |
| 23 124 km | 27 8 miles |
| 24 69.2 km | 28 250 miles |

C

Copy and complete by putting >, < or = in the box.

- 1 10 cm 0.09 m
- 2 1641 mm 16.41 m
- 3 50 g 0.05 kg
- 4 2288 ml 2.8 litres
- 5 3000 mm 0.003 km
- 6 1440 cm 0.04 km
- 7 25 g 0.025 kg
- 8 38 ml 0.008 litres

Convert to miles

- 9 47 km
- 11 73 km
- 10 9.4 km
- 12 53.8 km

Convert to kilometres.

- 13 1562 miles
- 14 284.6 miles
- 15 65.77 miles
- 16 12.29 miles
- 17 Each nail weighs 3.85 g. There are 24 nails in a packet. What is the total weight of the nails in 60 packets in kilograms?
- 18 A lorry travels 263 km in Belgium and 172 miles in England. How much longer in miles is the English journey?

Mastery

Which is larger:

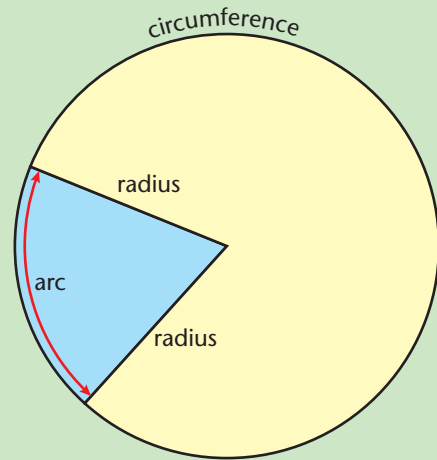
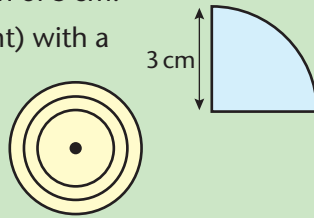
- (a) 17 km or 20,000 m (b) 10 litres or 1111 ml (c) 1 million mm or 1 km?

TARGET To illustrate and name parts of circles and know that the diameter is twice the radius.

A

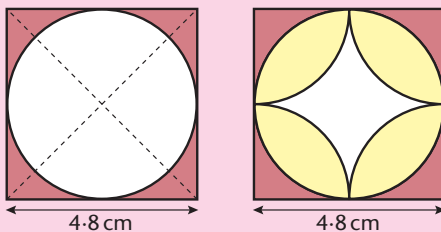
The radius is the distance from the centre of the circle to the perimeter (circumference).

- 1 Draw a circle with a radius of 3.5 cm. Draw and label a radius.
- 2 Draw a semicircle with a length of 5 cm.
- 3 Draw a quarter circle (quadrant) with a length of 3 cm.
- 4 Draw three concentric circles with radiuses of 1.5 cm, 2 cm and 2.5 cm.



B

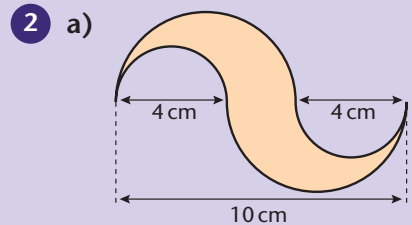
- 1 Draw a circle with a radius of:
 - a) 2.9 cm b) 3.3 cm c) 1.6 cm d) 2.2 cm
- 2
 - a) Draw and label a radius for each circle.
 - b) Draw and label a diameter for each circle.
 - c) Write the length of each diameter.
- 3 Draw a semicircle with a length of:
 - a) 5.0 cm b) 3.4 cm c) 4.6 cm d) 6.2 cm
- 4 Draw a quarter circle (quadrant) with a length of:
 - a) 2.8 cm b) 1.9 cm c) 3.7 cm d) 2.6 cm
- 5 Draw four concentric circles with radiuses of 1.8 cm, 2.1 cm, 2.4 cm and 2.7 cm.
- 6 Draw the circle touching the insides of the square by finding the centre of the square. Complete the pattern.



C

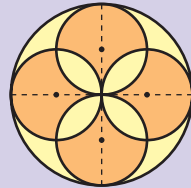
- 1 Draw five concentric circles with radiuses of 1.5 cm, 1.7 cm, 1.9 cm, 2.1 cm and 2.3 cm.

Draw the patterns.

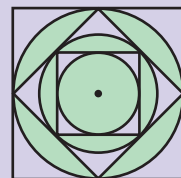


- b) Draw the same pattern with a length of 5 cm.

- 3 Draw the large circle with a radius of 3.2 cm.



- 4 Use the points where each circle touches its square to form another square. How many circles can you draw? Start with a large square.



Mastery

- What is the diameter of a circle if the radius = 5 cm?
- What is the diameter of a circle if the radius = 4.7 cm?
- What is the radius of a circle if the diameter = 15 cm?

Our numbers system, the decimal system, is based on groups of 10. In binary the numbers system is based on 2. Instead of units, 10s, 100s, 1000s and so on, the column values in binary numbers are units, 2s, 4s, 8s, 16s, etc.

Examples

16s	8s	4s	2s	1s	
	1	0	0	1	= 9 (one eight and one unit)
		1	1	0	= 6 (one four and one two)
1	0	0	0	0	= 16 (one sixteen)

A

Write in binary.

- | | |
|------|-------|
| 1 10 | 9 14 |
| 2 5 | 10 8 |
| 3 13 | 11 1 |
| 4 2 | 12 11 |
| 5 12 | 13 6 |
| 6 7 | 14 15 |
| 7 16 | 15 4 |
| 8 3 | 16 9 |

Write in decimal.

- | | |
|---------|----------|
| 17 1111 | 25 111 |
| 18 11 | 26 100 |
| 19 1001 | 27 1100 |
| 20 110 | 28 10000 |
| 21 1101 | 29 10 |
| 22 1 | 30 1010 |
| 23 101 | 31 1110 |
| 24 1011 | 32 1000 |

B

Write the answer in binary.

- 1 $5 + 7$
- 2 $15 - 13$
- 3 $12 - 6$
- 4 $6 + 9$
- 5 $11 + 3$
- 6 $14 - 4$
- 7 $7 + 6$
- 8 $11 - 8$

Convert to decimal.

Work out and write the answer in binary.

- 9 $11 + 1010$
- 10 $1100 - 100$
- 11 $1001 + 101$
- 12 $10000 - 1001$
- 13 $1000 + 10$
- 14 $1111 - 110$
- 15 100×10
- 16 $1111 \div 11$

C

Write in decimal.

- 1 11010
- 2 10101
- 3 11110
- 4 10011
- 5 100000
- 6 110000
- 7 11011
- 8 101110
- 9 10111
- 10 110100
- 11 100010
- 12 110001
- 13 11100
- 14 111001
- 15 100111
- 16 111110
- 17 Work out some other binary numbers and write their decimal equivalents.

Mastery

Write your age in both the binary and decimal system. Are there any similarities?