Written methods

- **Using written methods for addition, subtraction, multiplication and division of a mixture of integers and decimals with different numbers of decimal places**
- **Using problem–solving skills with calculations involving money**

Keywords

You should know

You should answer the questions in this topic without using a calculator.

explanation 1

1 Work out these additions.

a 7.5 + 11.6   **b** 21.3 + 9.7   **c** 941.2 + 18.9

d 201.26 + 46.8   **e** 376.98 + 25.12   **f** 819.23 + 114.72

2 Work these out.

a 32.6 + 4.38   **b** 27.2 + 43.79   **c** 0.913 + 21.4

d 0.084 + 21.791   **e** 5.982 + 0.048   **f** 34.29 + 9.671

3 Work these out.

a 13.87 + 641.2 + 51.03   **b** 0.197 + 46.9 + 12.1   **c** 98.4 + 3.74 + 101.25

d 29.519 + 0.003 + 9.2   **e** 9014.2 + 0.73 + 81   **f** 656 + 24.302 + 71.5

4 Work out these subtractions.

a 29.3 − 1.24   **b** 3.6 − 4.38   **c** 4.36 − 3.82

d 15.72 − 14.4   **e** 92.45 − 12.7   **f** 145.02 − 87.9

5 Work these out.

a 1.54 − 0.08   **b** 65.13 − 0.9   **c** 7.3 − 0.29

d 27.012 − 1.014   **e** 44.2 − 0.158   **f** 99.9 − 11.221

6 The temperature in Cambridge at midnight was 3.6 °C.
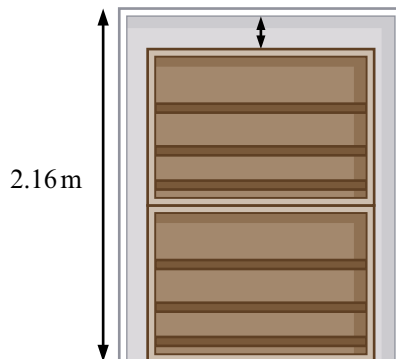By noon it had risen by 6.7 °C. What was the temperature at noon?

7 a The average yearly rainfall in London is 0.59 m. In Bangkok it is 1.45 m.
How much higher is the average yearly rainfall in Bangkok?

b One year Bangkok had 1.67 m of rain.
How much higher than the average London rainfall was that?

8 In 1900 the number of male criminal offenders in Britain was 0.5 per thousand of population.
In the year 2000 the number per thousand of population had risen to 4.1.

How much had the number per thousand risen by?

explanation 2

9 Work these out.

a $28.34 - 6 - 1.5$	**b** $83.4 - 9.01 - 0.002$	**c** $13.31 - 10.5 - 2.14$
d $105.32 - 8.89 - 0.4$	**e** $39.75 - 18.24 - 9.85$	**f** $194.4 - 0.067 - 1.55$
g $34.04 - 6.98 - 1.3$	**h** $109.56 - 34.09 - 3.77$	**i** $423.1 - 4.89 - 0.58$

10 Work these out.

a $95.21 - 7.4 + 10.26$	**b** $17.3 + 219.2 - 41.04$	**c** $101.85 - 19.73 + 65$
d $21.539 + 57.9 - 1.29$	**e** $2 - 0.344 + 50.8$	**f** $26.01 + 8.42 - 0.889$

11 a The maximum total weight of baggage
per person allowed by an airline is 20 kg.
A man has three bags which weigh
4.84 kg, 6.90 kg and 9.21 kg.
How much over the limit is his baggage?

9·21kg   6·90 kg   4·84kg

b Two shelf units of height 95.6 cm are
stacked together to fit in a cupboard
which is 2.16 m tall. What is the
maximum height of an object which can
be stored in the cupboard on top of the   2.16 m
shelf units?

12 1265 ml of squash is mixed in a jug and is poured into three glasses.
If the first two glasses have 451 ml and 398 ml in them, how much is left for
the third glass?

13 a On a recent shopping trip my friend bought four items priced at £3.45,
£9.50, £18.99 and £24.99. What was the total amount she spent?

b My friend had £60 when she set out. How much was left?

14 My budget allows me to spend £50 per month. In December I spent £65.25,
in January I spent £47.99, and in February I spent £49.35.
How much over or under budget was I in the whole three-month period?
What should my revised spending limit be in March in order to keep within
the overall budget?

explanation 3a   explanation 3b

For all remaining questions, estimate your answer first.

15 Work out these multiplications.

   a 9.3×4.8 **b** 5.4×7.1 **c** 12.6×34.5

   d 60.5×8.9 **e** 35.6×3.7 **f** 37.7×5.2

16 Work these out.

   a 0.4×7.7 **b** 4.3×0.8 **c** 86.4×0.3

   d 13.1×0.6 **e** 7.1×0.5 **f** 51.5×0.9

17 Work these out.

   a 70.2×0.71 **b** 28.5×89.1 **c** 0.067×3.9
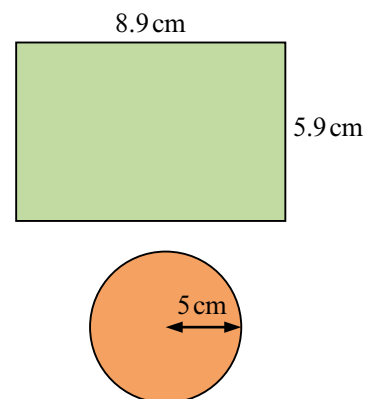
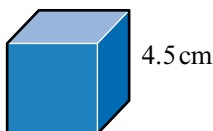   **d** 133.0×9.8 **e** 1.5×20.04 **f** 8.58×7.6

18 Eight people bought tickets for the zoo. Each ticket cost £5.65.
How much did the tickets cost altogether?

19 A club wants to take 832 people in coaches to a football match.
Each coach takes 52 people. How many coaches will be needed?

20 Maxine decorates cards using ribbon.
For one type of card she uses 0.16 m of ribbon.
Maxine pays £1.62 per metre for the ribbon.
How much does the ribbon for each card cost?

21 Sippy the slug moves 2.34 m each hour. How far will he move in 1.5 hours?

22 Kenny bought 2.3 kg of prawns at £9.80 per kilogram. How much did this cost?

23 Alice bought these for her end-of-year party. How much did each cost?

   a 4.2 kg of sausages at £5.20 per kilogram.

   b 3.4 m of party streamers at £6.70 per metre.

   c 9.5 litres of homemade lemonade at £1.60 per litre.

24 Josie bought 4.1 m, 3.8 m and 2.7 m lengths of wood for her woodwork
evening class. The wood was £6 per metre.
How much did she pay altogether?

25 a Find these lengths. Show your working.

     i The perimeter of the rectangle.

     ii The circumference of the circle.
        Use $\pi = 3.14$.
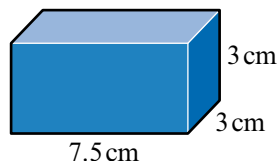
   b Which length is larger and by how much?

8.9 cm

5.9 cm

5 cm

26 Calculate the volume of these shapes.

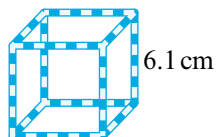   **a** Cube of side 4.5 cm   **b** Cuboid
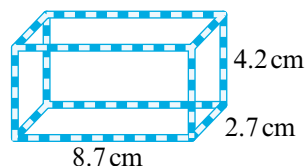
4.5 cm

3 cm
3 cm
7.5 cm

27 These 3-D shapes are to be constructed from straws.
Find the total length of straws needed in each case.
Check your answers by estimating.

   a Cube of side 6.1 cm   **b** Cuboid

6.1 cm

4.2 cm
2.7 cm
8.7 cm

explanation 4a   explanation 4b

28 Work these out.

   a $78 \div 6$ **b** $189 \div 9$ **c** $165 \div 11$

   d $2120 \div 40$ **e** $245 \div 35$ **f** $144 \div 16$

29 Work out these divisions.

   a $3.9 \div 0.3$ **b** $4.8 \div 0.2$ **c** $7.5 \div 0.25$

   d $0.72 \div 0.02$ **e** $93.6 \div 0.6$ **f** $1248 \div 0.08$

30 Work these out.

   a $14.28 \div 2.1$ **b** $27.3 \div 3.5$ **c** $40.7 \div 7.4$

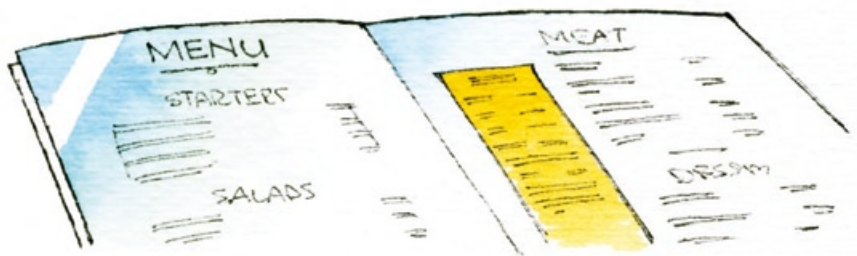   **d** $56.07 \div 6.3$ **e** $70.46 \div 1.3$ **f** $39.9 \div 4.2$

31 Jade bought 5.86 m of rope to replace one of the guy ropes on her tent.

   a The rope cost £2.54 per metre. How much did Jade's rope cost?

   b How much would it cost to replace two guy ropes?

32 Khalid spent £30.55 on 9.4 litres of oil for his motor bike.
How much did the oil cost per litre?

33 Olivia's group used $53.75\,m^2$ of groundsheet to cover a 12.5 m long campsite.
How wide was the campsite?

34 **a** Karl is paid a basic rate of £5.24 per hour.
How much does he earn during a 5-day working week of 37.5 hours?

b His overtime rate is 1.5 times the basic rate.
What does he earn for 12 hours' overtime at the weekend?

c What is the total amount he earns over this 7-day period?

d How many hours does Karl work if he earns £167.68 at the basic rate?

e After a pay rise, his basic rate has increased by £0.36 per hour.
What does he earn now for a working week plus 12 hours of overtime?

35 Eleven friends go out for a meal together. The total bill comes to £131.56.

a If the friends share the cost equally among them, how much does each of them pay?

b If three of the friends pay £15 each, how much will each of the others pay?

c If a 10% service charge is added to the bill and the whole amount is shared equally among all the friends, how much does each of them pay altogether (to the nearest penny)?

36 A car hire company in the USA charges $35.90 per day plus $11.55 insurance per day and a one-off charge of $35 for petrol.

a What is the total cost of hiring a car for 8 days?

b If the exchange rate is $1.85 to the pound, what is the cost in pounds sterling?