1 Candles cost £3.05 each.
Theo has £30 to spend on candles.
He buys as many candles as he can for £30

Work out how much change Theo should get.

$30 \div 3.05 = 9.83$ (1) so Theo can get 9 whole candles

$9 \times 3.05 = 27.45$ 9 candles cost £27.45

$30 - 27.45 = 2.55$ (1) the change is £2.55

£ 2.55 (1)

(Total for Question 1 is 3 marks)

2

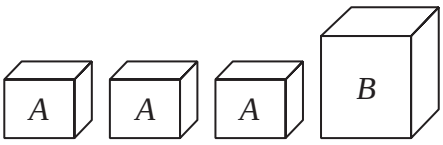


Diagram **NOT** accurately drawn

The diagram shows four parcels.
The total weight of the four parcels is 8.3 kg.

The weight of the parcel labelled *B* is 3.2 kg.
Each of the three parcels labelled *A* have the same weight.

(a) Work out the weight of each of the parcels labelled *A*.

$8.3 = 3A + B$
$8.3 = 3A + 3.2$ ↘ $B = 3.2$
-3.2 ↘ $5.1 = 3A$ (1)
$1.7 = A$ ↘ $\div 3$

1.7 (1) ..... kg

(2)

Here are another three parcels.

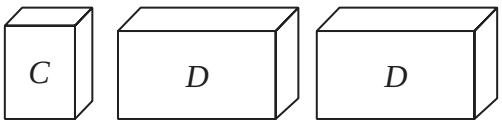


Diagram **NOT** accurately drawn

The total weight of the three parcels is 9.45 kg.

Each of the two parcels labelled *D* have the same weight.

The weight of each parcel labelled *D* is 3× the weight of the parcel labelled *C*.

(b) Work out the weight of the parcel labelled *C*.

$9.45 = 2D + C$
$9.45 = 2(3c) + C$ ↘ $D = 3 \times c$ so replace D with 3c
$9.45 = 6c + C$
$9.45 = 7c$ (1)
$\div 7$ ↘ $1.35 = C$

1.35 (1) ..... kg

(2)

(Total for Question 2 is 4 marks)

3 There are 32 children in a nursery.

Sandeep buys 5 boxes of balloons.
There are 25 balloons in each box.

Sandeep shares the balloons equally between the 32 children so that each child gets as many balloons as possible.

Work out the number of balloons that are not shared between the 32 children.

Total balloons = $25 \times 5 = 125$ balloons (1)

$$\begin{array}{r} 3 \\ 32\overline{)125} \\ -\ 96 \\ \hline 29 \end{array}$$ (1) (1) balance

(1) 29 balloons

(Total for Question 3 is 4 marks)

4 Freda is playing a car racing game on her computer.

She sets up her computer so that her car completes each lap in the same number of seconds.
Her car completes 3 laps in 72 seconds.

To win the game, Freda has to complete 68 laps in less than half an hour.

Does Freda win the game?
Give a reason for your answer.

Find the time she completes in 1 lap :

$\frac{72\ s}{3\ lap} = 24\ s$ per lap (1)

Find the time taken to complete 68 laps :

68×24 (1) $= 1632\ s \div 60$ ← convert to minutes

$= 27.2$ minute (1)

∴ Yes. Freda wins the game. (1)

(Total for Question 4 is 4 marks)

5 Matt buys a notebook and some pencils.

The notebook costs $2.35
Each pencil costs $0.74

Matt has a total of $20 to spend on the notebook and the pencils.
He buys the greatest number of pencils that he can.

Work out how many pencils he buys.

Finding the amount of money Matt can spend on pencils:

$20 - 2.35 = 17.65$ (1)

Finding how many pencils he can buy:

$\frac{17.65}{0.74} = 23.85$ (1) ← not enough to buy 24

∴ Matt can by maximum of 23 pencils. (1)

23

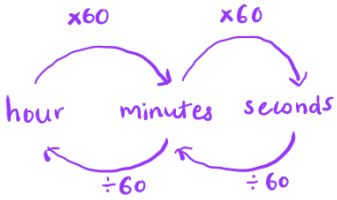
(Total for Question 5 is 3 marks)

6 Toy cars are made in a factory.
The toy cars are made for 15 hours each day.
5 toy cars are made every 12 seconds.

For the toy cars made each day, the probability of a toy car being faulty is 0.002

Work out an estimate of the number of faulty toy cars that are made each day.

15 hours x 60 x 60 = 54 000 seconds (1)



∴ 12 seconds = 5 cars

∴ 54000 seconds = $\frac{54000}{12}$ x 5 = 22500 cars (1)

∴ Faulty car each day = 0.002 x 22500 cars (1)

= 45 faulty cars (1)

45

(Total for Question 6 is 4 marks)

7 The table gives the minimum temperature for January 2018 in each of six cities.

City	Minimum temperature (°C)
Barcelona	3
Donetsk	−10
Mexico City	−1
Mombasa	22
New York	−15
Sydney	15

(a) Which of these six cities has the lowest minimum temperature?

New York (1)

.....

(1)

(b) Work out the difference between the minimum temperature of Donetsk and the minimum temperature of Sydney.

15 - (-10)

= 25 (1)

25 °C

.....

(1)

The minimum temperature in Edmonton for January 2018 was 50°C less than the minimum temperature in Mombasa for January 2018

(c) Work out the minimum temperature in Edmonton for January 2018

22 - 50

= -28 (1)

-28 °C

.....

(1)

(Total for Question 7 is 3 marks)

8 At 6 pm, the temperature in Victoria's garden was 5 °C.
By midnight, the temperature in Victoria's garden had fallen by 9 °C.

(a) Work out the temperature in Victoria's garden at midnight.

$= 5 - 9$ (1)
$= -4\,°C$

-4 (1) °C
(2)

Here is a list of 7 temperatures.

4 °C −6 °C 4 °C 0 °C −1 °C −7 °C −5 °C

(b) For the 7 temperatures in the list,

(i) write down the mode,

Mode : highest frequency

4°C appears twice, so that is the mode

4°C (1) °C
(1)

(ii) find the median.

List all numbers from lowest to highest

$-7°C, -6°C, -5°C, -1°C, 0°C, 4°C, 4°C$ (1)

↑ middle value

−1 (1) °C
(2)

(Total for Question 8 is 5 marks)

9 (c) Work out the difference between the land area of Botswana and the land area of Kenya.

569 140 - 566 730

= 2410 (1)

2410 ..... km^2

(1)

(Total for Question 9 is 1 marks)

10 The table gives information about the boiling points and the freezing points of some elements.

Element	Chlorine	Mercury	Neon	Oxygen
Boiling point (°C)	–35	357	–246	–183
Freezing point (°C)	–101	–39	–249	–218

Dr Strauss is going to cool chlorine from its boiling point to its freezing point.
He knows that it will take 2 minutes for the temperature of the chlorine to go down 10 °C.

(d) Work out how long it will take the chlorine to cool from its boiling point to its freezing point?

Difference between boiling point and freezing point :

$-35 - (-101) = 66$ (1)

Finding scale factor :

$\frac{66^{\circ}C}{10^{\circ}C} = 6.6$

6.6×2 minutes $=$ 13.2 minutes (1)

13.2 ..... minutes

(2)

(Total for Question 10 is 2 marks)

11 Find the number that is exactly halfway between 3.7 and 6.1

$\frac{6.1 - 3.7}{2} = \frac{2.4}{2} = 1.2$ (1)

$3.7 + 1.2 = 4.9$ (1)

4.9

(Total for Question 11 is 2 marks)

12 The table shows the populations of five countries.

Country	Population
China	1.4×10^9
Germany	8.2×10^7
Sweden	9.9×10^6
Fiji	9.1×10^5
Malta	4.3×10^5

Given that

$$\text{population of Fiji} = \frac{1}{k} \times \text{population of Sweden}$$

(b) work out the value of k.
Give your answer correct to the nearest whole number.

Fiji = 9.1×10^5

Sweden = $9.9 \times 10^6 = 99 \times 10^5$

$9.1 \times 10^5 = \frac{1}{k} \times 99 \times 10^5$

$k = \frac{99 \times 10^5}{9.1 \times 10^5}$ (1)

$= 11$ (1)

$k =$ 11

(2)

(Total for Question 12 is 2 marks)

13 Jethro has sat 5 tests.
Each test was marked out of 100 and Jethro's mean mark for the 5 tests is 74

Jethro has to sit one more test that is also to be marked out of 100

Jethro wants his mean mark for all 6 tests to be at least 77

Work out the least mark that Jethro needs to get for the last test.

Jethro's total marks for 5 tests :

$74 \times 5 = 370$ (1)

To get mean marks of 77 or more :

$\frac{370 + x}{6} = 77$ x : mark for 6th test

$370 + x = 77 \times 6$

$370 + x = 462$ (1)

$x = 462 - 370 = 92$ (1)

92

(Total for Question 13 is 3 marks)

14 This formula can be used to work out the cost, in riyals, of hiring a bicycle in Qatar for a number of days.

Cost = 65 × number of days + 44

Ghalia hired a bicycle in Qatar for 14 days.

(a) Work out the cost.

cost = 65 × 14 + 44 (1)

= 954 (1)

954 riyals

(2)

This formula can be used to work out the cost, in riyals, of hiring a helmet in Qatar for a number of days.

Cost = 12.5 × number of days

Kasun wants to hire a bicycle and a helmet for the same number of days.
He wants to hire them for as many days as he can.
He has 750 riyals to spend.

(b) Work out how much of the 750 riyals is not spent.

750 = [65 × days + 44] + [12.5 × days]

750 − 44 = 65 days + 12.5 days (1)

706 = 77.5 days

$\text{days} = \frac{706}{77.5}$

= 9.109 (1)

∴ Kasun can only afford 9 days

706 = 77.5 (9) (1)

706 = 697.5

706 − 697.5 = 8.5 (1)

∴ 8.5 riyals left unspent

8.5 riyals

(4)

(Total for Question 14 is 6 marks)

15 Sabbir has some boxes of bananas and some sacks of tomatoes.
The weight of each box of bananas is the same and the weight of each sack of tomatoes is the same.

The weight of 3 boxes of bananas is 42 kg.
The weight of 8 sacks of tomatoes is 68 kg.

Work out the total weight of 9 boxes of bananas and 15 sacks of tomatoes.

1 box of bananas $= \frac{42\text{ kg}}{3} = 14\text{ kg}$

1 sack of tomatoes $= \frac{68\text{ kg}}{8} = 8.5\text{ kg}$ (1)

Total weight of 9 boxes of bananas and 15 sacks of tomatoes:

$(9 \times 14) + (15 \times 8.5)$

$= 126 + 127.5$ (1)

$= 253.5\text{ kg}$ (1)

253.5 ..... kg

(Total for Question 15 is 3 marks)

16 In Berlin, a watch costs 120 euros.
In Dubai, the same model of watch costs 600 dirhams.

The currency exchange rates are

Exchange rates
£1 = 1.16 euros
1 dirham = 0.24 euros

Calculate the difference between the cost of the watch in Berlin and the cost of the same model of watch in Dubai.
Give your answer in pounds (£) correct to 2 decimal places.

Berlin : $\frac{120}{1.16} = 103.45$ (1)

Dubai : $\frac{600 \times 0.24}{1.16} = 124.14$ (1)

Difference : $124.14 - 103.45$ (1)

$= 20.69$ (1)

£ 20.69

(Total for Question 16 is 4 marks)

17 On Wednesday, the price of 1 litre of petrol was £1.26
The price of petrol on Wednesday was 5% more than the price of petrol on the previous Monday.

Calculate the price of 30 litres of petrol on the previous Monday.

Let the price of 1 litre petrol on Monday = x

$$x + \frac{5}{100}x = 1.26$$

$$1.05x = 1.26$$

$$x = \frac{1.26}{1.05}$$

$$= 1.2 \quad (1)$$

Price of 30 litres of petrol on Monday:

$$1.2 \times 30 = 36 \quad (1)$$

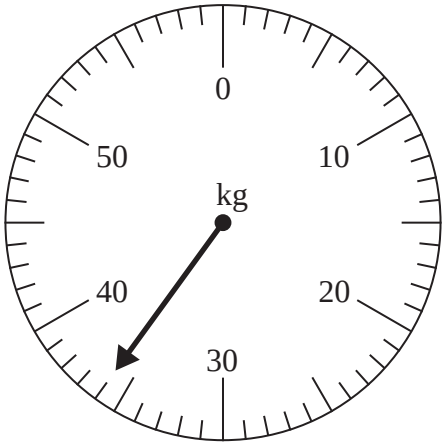
(1)

£ 36

(Total for Question 17 is 3 marks)

18 Amir is going on holiday.

He weighs his suitcase on the weighing scales at the airport.
The reading on the scale gives the weight of Amir's suitcase.



An excess luggage charge has to be paid when the weight of a suitcase is greater than 25 kg.
This charge is 7.45 euros for each kilogram over the 25 kg limit.

Work out the excess luggage charge that Amir has to pay.

Amir's luggage weight = 36 kg

36 - 25 = 11 kg

11 x 7.45 euros = 81.95

(2)

81.95 (1) ..... euros

(Total for Question 18 is 3 marks)

19 Elvira and Anja go on holiday to Sweden and to Finland.

In Sweden, Elvira bought some trainers for 438 Swedish krona.
In Finland, Anja bought the same type of trainers for 44.39 euros.

1 Swedish krona = 0.12 dollars

1 dollar = 0.92 euros

Work out the difference in the cost of the trainers bought by Elvira and the trainers bought by Anja.
Give your answer in dollars.

438 × 0.12 = 52.56 dollars (1)

44.39 ÷ 0.92 = 48.25 dollars (1)

52.56 − 48.25 = 4.31 dollars

(1) (1)

4.31 dollars

(Total for Question 19 is 4 marks)

20 Masie is told that $13\,203 \div 27 = 489$

Explain how she can use this calculation to work out 489×28

$489 \times 27 = 13203$

$489 \times 28 = (489 \times 27) + (489 \times 1)$

$= 13203 + 489$

$= 13\,692$ (2)

$$\begin{array}{r} {}^{1}13\,203 \\ +\quad 489 \\ \hline 13\,692 \end{array}$$

Add 489 to 13203.

(Total for Question 20 is 2 marks)

21 Jakub has bought a chicken.

He is going to use this rule to work out the number of minutes it will take to cook his chicken.

Cooking time (minutes)

Multiply the chicken's weight, in kg, by 40
Then add
30

The weight of Jakub's chicken is 2.6 kg

(a) Use the rule to work out the number of minutes it will take to cook Jakub's chicken.

Cooking time = (2.6 kg × 40) + 30 (1)

= 104 + 30

= 134 (1)

134 ..... minutes

(2)

The following week Jakub buys another chicken.

He uses the rule and works out that it will take 2 hours 40 minutes to cook this chicken.

(b) Work out the weight of this chicken.

1 hour = 60 minutes

2 hours 40 minutes = (2 × 60) + 40

= 160 minutes (1)

160 = (weight × 40) + 30

weight = $\frac{160 - 30}{40}$ (1) = 3.25 kg (1)

3.25 ..... kg

(3)

(Total for Question 21 is 5 marks)

22 Danielle is going to print some business cards.

She uses this rule to work out the total cost, in euros, of printing the business cards.

Total cost = price per card × number of cards + fixed fee

price per card = 0.14 euros
fixed fee = 25 euros

Danielle is going to print 350 business cards.

Work out the total cost of printing the business cards.

$0.14 \times 350 = 49$ (1)

$49 + 25 = 74$ (1)

(1)

74 ..... euros

(Total for Question 22 is 3 marks)

23 Angelina buys

3 packets of seeds at $2.45 each packet
2 bags of compost at $6.20 each bag
and 4 plant pots

Each plant pot costs the same amount of money.

Angelina paid a total of $34.35 for the seeds, compost and plant pots.

Work out the cost of each plant pot.

$3 \times 2.45 = 7.35$ (1)

$2 \times 6.20 = 12.40$

$7.35 + 12.40 = 19.75$

$34.35 - 19.75 = 14.60$ (1)

$14.60 \div 4 = 3.65$ (1)

(1)

$ 3.65

(Total for Question 23 is 4 marks)

24 Mairi has a 2 metre length of string.
She cuts from the string as many lengths of 35 centimetres as possible.

Work out the length of string that she has left.
Give your answer in centimetres.

$2\text{m} \times \frac{100\text{ cm}}{1\text{ m}} = 200\text{ cm}$ (1)

$\frac{200\text{ cm}}{35\text{ cm}} = 5.714\ldots$

$= 5$ strings

$5 \times 35 = 175$ cm (1)

$200 - 175 = 25$ (1)

25 cm

(Total for Question 24 is 3 marks)

25 Zoya buys a book and some pencils.

The book costs £6.90
Each pencil costs £0.55

Zoya has a total of £15 to spend on the book and the pencils.
She buys as many pencils as she can.

Work out how many pencils she buys.

15 - 6.90 = 8.10 (1)

8.10 ÷ 0.55 = 14.727...
(1)
≈ 14 (1)

14

(Total for Question 25 is 3 marks)

26 Aarav uses this rule to estimate the time, in minutes, that a bus journey takes.

Time	=	2.5 × length of journey in kilometres	+	1.5 × number of bus stops

Aarav's bus journey to work has a length of 12 kilometres.
There are 5 bus stops on the route.

(a) Use Aarav's rule to work out an estimate for the time this bus journey takes.

Time = $2.5 \times 12 + 1.5 \times 5$ (1)

$= 30 + 7.5$

$= 37.5$ (1)

37.5 ..... minutes

(2)

A different bus journey takes 55 minutes.
There are 8 bus stops on the route.

(b) Use Aarav's rule to work out an estimate for the distance of this bus journey.

$55 = 2.5 \times \text{distance} + 1.5 \times 8$ (1)

$\text{distance} = \frac{55 - 12}{2.5}$ (1)

$= \frac{43}{2.5}$

$= 17.2$ (1)

17.2 ..... km

(3)

(Total for Question 26 is 5 marks)

27 Luca has 5 kg of chopped tomatoes.
He also has some empty tins.

When full, each tin holds 350 g of chopped tomatoes.

Luca fills as many tins as possible with the chopped tomatoes.

Work out the weight of the chopped tomatoes remaining after Luca has filled as many tins as possible.
Give the units of your answer.

$5 \text{ kg} \times 1000 = 5000 \text{ g}$ (1)

$\frac{5000}{350} = 14.2857\ldots$

≈ 14 (1)

$350 \text{ g} \times 14 = 4900 \text{ g}$ (1)

$5000 \text{ g} - 4900 \text{ g} = 100 \text{ g}$ (1)

100 g

(Total for Question 27 is 4 marks)

28 Sandeep sells 600 tickets for an event.
He receives a total of $7200 from selling the tickets.

$\frac{1}{4}$ of the tickets sold are child tickets.

The rest of the tickets sold are adult tickets.

The cost of an adult ticket is $13.60

Work out the cost of a child ticket.

child: $\frac{1}{4} \times 600 = 150$ (1)

Adult: $600 - 150 = 450$

$450 \times 13.60 = 6120$ (1)

$\frac{7200 - 6120}{150} = \frac{1080}{150}$ (1)

$= 7.20$ (1)

$ 7.20

(Total for Question 28 is 4 marks)

29 The table gives information about the costs of sending parcels of different weights.

Weight (w kg)	Cost of sending a parcel
$0 < w \leqslant 1$	£6.00
$1 < w \leqslant 2$	£9.02
$2 < w \leqslant 5$	£15.85
$5 < w \leqslant 10$	£21.90

Peony has one parcel of weight 1.3 kg and another parcel of weight 8 kg to send to two different places.

(a) Work out the total cost of sending these two parcels.

9.02 + 21.90 = 30.92
(1) (1)

£ 30.92

(2)

Gryffyn sends 3 parcels each to a different place.
One of the parcels has a weight of 1.5 kg and another of the parcels has a weight of 2.8 kg
The total cost of sending the 3 parcels is £33.89

(b) Work out the greatest possible weight of the third parcel.

9.02 + 15.85 = 24.87 (1)

33.89 - 24.87 = 9.02
(1)

2 (1) kg

(3)

(Total for Question 29 is 5 marks)

Total cost = 8 euros per day plus 5 euros

30 James hires a cement mixer for 3 days.

(c) Work out the cost to James of hiring the cement mixer.

$8(3) + 5 = 29$

29 ✓1

..... euros

(1)

The cost to Sophia of hiring a cement mixer is 61 euros.

(d) For how many days does Sophia hire the cement mixer?

$61 = 8d + 5$ ✓1

$8d = 56$

$d = \frac{56}{8} = 7$ ✓1

7

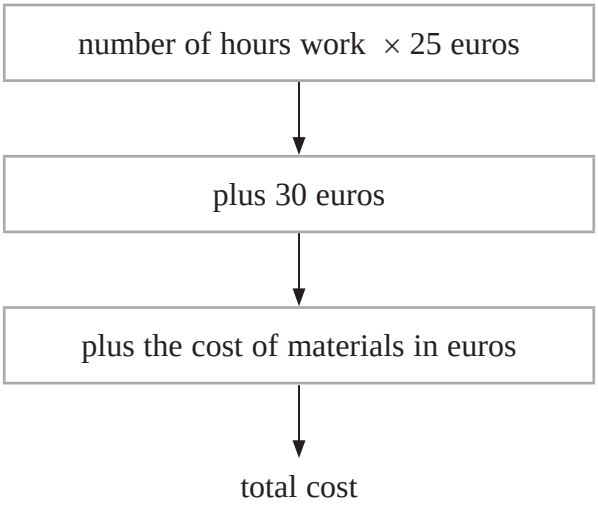
..... days

(2)

(Total for Question 30 is 3 marks)

31 Georgia is a plumber.

She uses this rule to work out the total cost, in euros, of her customers' bills.



Georgia does some plumbing work for Tallulah.

She works for 3 hours.
The cost of the materials she uses is 42 euros.

(a) Work out the total cost of Tallulah's bill.

Total cost : $(3 \times 25) + 30 + 42$ (1)

$= 75 + 30 + 42$

$= 147$ (1)

147 ..... euros

(2)

Georgia also does some plumbing work for Sam.

The cost of the materials she uses is 65 euros.
The total cost of Sam's bill is 220 euros.

(b) Work out the number of hours that Georgia works for Sam.

Let number of hours $= x$

$220 = 25x + 30 + 65$ (1)

$25x = 220 - 30 - 65$

$25x = 125$

$x = \frac{125}{25}$ (1) $= 5$ (1)

5 ..... hours

(3)

(Total for Question 31 is 5 marks)

32 Carla wraps some parcels with ribbon.
She wraps 2 large parcels and 3 small parcels.

For each large parcel, Carla uses 185 centimetres of ribbon.
For each small parcel, she uses p centimetres of ribbon.

In total, Carla uses exactly 7 metres of ribbon to wrap the parcels.

Find the value of p

$2(185) + 3p = 7(100)$ (1)

$370 + 3p = 700$

$3p = 330$ (1)

$p = \frac{330}{3} = 110$ cm (1)

$p =$ 110 cm

(Total for Question 32 is 3 marks)

33 Adriana makes some cupcakes.

She sells each cupcake for £2.20

Mike buys 6 of these cupcakes.
He pays with a £20 note.

(a) Work out how much change Mike should receive.

$6 \times 2.20 = 13.20$ (1)

$20 - 13.20 = 6.80$ (1)

£ 6.80

(2)

Greta sells balloons.

She sells each balloon for £0.85

Stefan has £50 to spend on balloons.

(b) Work out the greatest number of balloons he can buy.

No. of balloons : $\frac{50}{0.85} = 58.82$ (1)

$= 58$ balloons (1)

58

(2)

(Total for Question 33 is 4 marks)