1 A drink is made by adding water to juice.

> **Instructions**
>
> Add an amount of water that is between 2 times and 3 times the amount of juice

Rana has 120 ml of juice.

She adds some water.

She has now made 450 ml of the drink.

Has Rana followed the instructions?

You **must** show your working.

[3 marks]

$2 \times 120\ ml = 240\ ml$ (1)

$3 \times 120\ ml = 360\ ml$

$450\ ml - 120\ ml = 330\ ml$ (1)

(1)

Yes, Rana followed the instruction since the water she used is within the limit.

2 George buys some food for £16.55

He pays the exact amount with two notes and four coins.

List the notes and coins.

[2 marks]

Notes £10 £5 (2)

Coins 50p 50p 50p 5p

3 The cost of 5 kg of potatoes is £3.20

The cost of $\frac{1}{2}$ kg of carrots is 29p

Work out the **total** cost of 12 kg of potatoes and $1\frac{1}{2}$ kg of carrots.

[3 marks]

Potatoes : $\frac{12}{5} \times £3.20 = £7.68$

carrots : $3 \times £0.29 = £0.87$ (1)

Total : £7.68 + £0.87 (1)

= £8.55 (1)

Answer £ 8.55

4 Luke buys 4 apples and 5 bananas.

The total cost is £3.70

Each apple costs 35p

Work out the cost in pence of each banana.

[4 marks]

$4 \times £0.35 = £1.40$ (1)

$£1.40 + 5B = £3.70$

$5B = £3.70 - £1.40$ (1)

$= £2.30$

$B = £2.30 \div 5$ (1)

$= £0.46$

$= 46p$ (1)

Answer 46 pence

5 A travel company is taking some passengers on a trip.

They can use coaches or minibuses.

Each coach can carry 53 passengers.

Each minibus can carry 12 passengers.

The passengers going on the trip would exactly fill 3 coaches.

If the company uses only minibuses, how many will they need?

[4 marks]

53 × 3 = 159 (1)

(1) 159 ÷ 12 = 13.25 (1)

They need 14 minibuses to bring all passengers

Answer 14 (1)

6 Annie spends these amounts in four shops using £20 notes, £10 notes and £5 notes.

Shop A	£65
Shop B	£40
Shop C	£115
Shop D	£75

In each shop she

pays the exact amount

uses the **smallest** possible number of notes.

Work out the total number of each note she uses.

[3 marks]

Shop A : 3 × £20 + 1 × £5

Shop B : 2 × £20

Shop C : 5 × £20 + 1 × £10 + 1 × £5

Shop D : 3 × £20 + 1 × £10 + 1 × £5

£20 : 3 + 2 + 5 + 3 = 13

£10 : 1 + 1 = 2 , £5 : 1 + 1 + 1 = 3

Number of £20 notes 13 (1)

Number of £10 notes 2 (1)

Number of £5 notes 3 (1)

7 Harry and his sister Jess have some money in the ratio Harry : Jess = 1 : 4

Harry has £7.35

They pay £16.99 for a present for a friend.

Harry uses $\frac{1}{3}$ of his money.

Jess pays the rest.

How much money does Jess have left?

[4 marks]

Jess : £7.35 × 4 = £29.40 (1)

$\frac{1}{3}$ × 7.35 = 2.45 (1)

16.99 − 2.45 = 14.54

29.40 − 14.54 = 14.86 (1) (1)

Answer £ 14.86

8 Lynn works as a bus driver.

She is paid £10.80 per hour for the first 38 hours she works each week.

She is paid 25% **more** per hour for each extra hour she works.

One week, Lynn was paid £491.40

In total, how many hours did she work that week?

You **must** show your working.

[5 marks]

$1.25 \times 10.80 = 13.50$ (1)

(1)

$38 \times 10.80 = 410.40$ (1)

$491.40 - 410.40 = 81$

$81 \div 13.50 = 6$ (1)

Total hours : $38 + 6 = 44$ (1)

Answer 44 hours

9 Boxes of chocolates each contain 25 chocolates.

One box costs £3.25

A shop has a special offer.

Two boxes for £5

How much cheaper **per chocolate** is the special offer?

[3 marks]

price of each chocolate : $\frac{3.25}{25}$ = 0.13 (1)

price of each chocolate from special offer : $\frac{5}{2 \times 25}$ = 0.10

0.13 - 0.10 = 0.03

(1) = 3 pence

(1)

Answer 3 pence

10 A machine takes 4 seconds to fill a packet of crisps.

10 (a) In total, how many packets can 35 of these machines fill in 8 hours?

[4 marks]

$8 \times 60 \times 60 = 28\,800$

$\frac{28800}{4} = 7200$

$7200 \times 35 = 252\,000$

4

Answer 252 000

10 (b) Each packet of crisps contains 32.5 grams of crisps.

At what rate does a machine put the crisps into the packets?
Give your answer in grams per second.

[2 marks]

$32.5\,g \div 4\,s = 8.125\,g/s$

1 1

Answer 8.125 grams per second

11

	Cost of 100 grams
Cereal	49p
Pasta	14p

Leah buys 400 grams of cereal and 250 grams of pasta.

Work out the **total** cost in £

[4 marks]

cereals : $49p \times \frac{400}{100} = 196p$ (1) (1)

pasta : $14p \times \frac{250}{100} = 35p$

Total : $196p + 35p = 231p$ (1)

$= £2.31$ (1)

Answer £ 2.31

12 Companies A and B sell insurance for mobile phones.

The table shows the **monthly** costs for two types of cover, Damage and Loss.

Company	Damage	Loss
A	£8.65	£12.20
B	£7.25	£14.10

12 (a) Work out the difference in monthly cost for the two types of cover with **Company A**.

[2 marks]

12·20 - 8·65 = 3.55

(1) (1)

Answer £ 3·55

12 (b) Ben wants Damage cover with **Company B**.

How much in total will he pay for one **year**?

[3 marks]

monthly : 7·25 (1)

yearly : 7·25 × 12

: 87·00 (1)

Answer £ 87

13 A machine to clean carpets can be hired.

Machine hire
£25 per day

Cleaning fluid	
1-litre bottle	£10
2-litre bottle	£18

Rana wants to

hire the machine for 1 day

and

buy 5 litres of cleaning fluid.

5 x 1 litre = £50

1 x 2l + 3 x 1l = 18 + 3 x 10

= 18 + 30

= 48

Work out the **smallest** total amount she could pay.

[3 marks]

Machine hire = £25

Cleaning fluid = 2 × £18 + 1 × £10

= £36 + £10

= £46 (1)

Total = 25 + 46 (1)

= 71 (1)

Answer £ 71

14 (a) Ali revises each day for five days.

On each of the first **four** days he revises from 5 pm to 8 pm

On the fifth day he starts revising at 1 pm

He finishes when he has revised for a **total** of 18 hours for the five days.

What time does he finish on the fifth day?

[3 marks]

First four days : $4 \times (8-5)$

$= 12$ hours (1)

Fifth day : $18 - 12 = 6$ hours (1)

1 pm + 6 hours = 7 pm (1)

Answer 7 pm

14 (b) Sofia is revising for Maths.

She tries to work out $3 \times (4 + 2)$

Here is her working.

$$3 \times (4 + 2) = 12 + 3$$
$$= 15$$

What mistake has she made?

[1 mark]

It should be $3 \times 6 = 18$ since she needs to solve the calculation in the bracket first. (1)

15 Pens cost 20p each.

Rulers cost 60p each.

Saj buys some pens and some rulers.

He buys 8 rulers.

The total cost is £10

How many pens does he buy?

[3 marks]

let number of pens = x

$8 \times 0.60 + 0.20x = 10$

$4.80 + 0.20x = 10$ (1)

$0.20x = 5.20$ (1)

$x = 26$ (1)

Answer 26

16 In this question use 1 litre = 1000 millilitres

A mixture is made using white paint and red paint.

amount of white paint = amount of red paint ÷ 7

5.6 litres of red paint will make **more** than 6 litres of the **mixture**.

How much more?

Give your answer in millilitres.

[4 marks]

White paint = $\frac{5.6}{7}$ = 0.8 (1)

Mixture = 5.6 + 0.8 = 6.4 (1)

6.4 − 6.0 = 0.4 ℓ × $\frac{1000\ ml}{1\ \ell}$ (1)

= 400 ml

Answer 400 (1) ml

17 An empty container is a cylinder of radius 3.5 cm and height 40 cm

A tennis ball is a sphere of radius 3.5 cm

Will six of the tennis balls fit in the container?

Tick a box.

Yes ☐ No ☑ (1)

Show working to support your answer.

[2 marks]

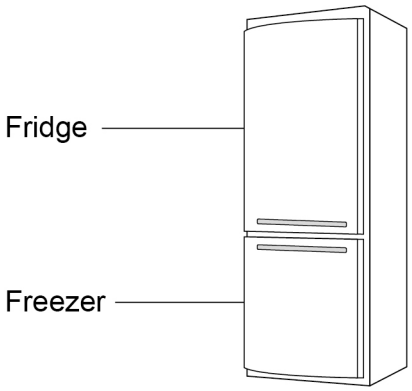
diameter of ball = $2 \times 3.5 = 7$ cm

$7 \times 6 = 42$ cm $>$ 40 cm

(1)

18 Information about two fridge-freezers, A and B, is shown.

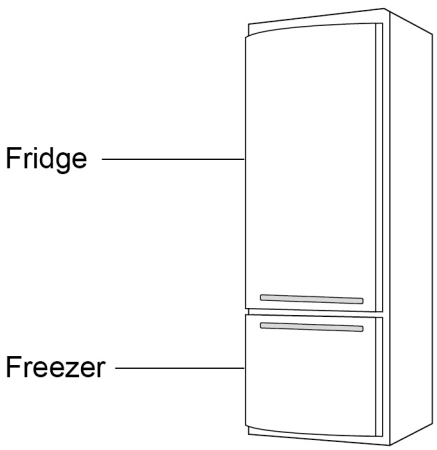
A



Total capacity is 330 litres

fridge capacity : freezer capacity = 3 : 2

B



Fridge capacity is 294 litres

fridge capacity : freezer capacity = 7 : 3

Grace buys one of these fridge-freezers.

She buys the one with the greater **freezer** capacity.

Which one does she buy?

You **must** show your working.

[4 marks]

A : $\frac{2}{3+2} \times 330 = \frac{2}{5} \times 330 = 132$ (1) (1)

B : $\frac{294}{7} \times 3 = 126$ (1)

Grace buys A. (1)

Answer A

19 At a shop

the normal price of one pen is 24p

the normal price of one calculator is £7

The shop has these special offers.

Pens	**Calculators**
Half the normal price	£1.50 less than the normal price

Work out the **total** price of 5 pens and 1 calculator using the special offers.

[4 marks]

Pen : $\frac{1}{2} \times 0.24 = 0.12$ (1)

Calculators : $7 - 1.5 = 5.50$

(1)

Total : $5(0.12) + 5.50$

$= 0.60 + 5.50$ (1)

$= 6.10$ (1)

Answer £ 6.10

20 Jess saves 2p, 5p and 10p coins.

She has

- 45 10p coins
- 8 times as many 2p coins as **10p coins**
- £17.70 in total.

Work out total **value** of 2p coins : total **value** of 5p coins

Give your answer in its simplest form.

[4 marks]

2p : $45 \times 8 = 360$ coins (1)

5p : $17.70 - (45 \times 0.10) - (360 \times 0.20)$

: $17.70 - 4.50 - 7.20$ (1)

: 6.00 (1)

2p : 7.20

2p : 5p = $7.20 : 6.00$ } $\div 12$

: $6 : 5$ (1)

Answer 6 : 5

21 A reel holds 9.5 metres of ribbon.

2 pieces of ribbon are cut from the reel.

Each piece is 20 centimetres long.

What length of ribbon is left on the reel?

State the units of your answer.

[3 marks]

20 cm ÷ 100 = 0.2 m (1)

0.2 m x 2 = 0.4 m (1)

9.5 m - 0.4 m = 9.1 m (1)

Answer 9.1 m

22 This week, Liam works

25 hours at £10.20 per hour

and

extra hours at the weekend at £11.80 per hour.

Here are the extra hours he works at the weekend.

Saturday	7 am to 10 am
Sunday	1 pm to 3 pm

In **total**, how much is he paid this week?

[4 marks]

25 × £10.20 = £255 (1)

Saturday: 3 × £11.80 = £35.40 (1)

Sunday: 2 × £11.80 = £23.60

Total: 255 + 35.40 + 23.60 (1)

= 314 (1)

Answer £ 314

23 Jing has £2450

She saves some and gives the rest to her four brothers.

money saved : money given to brothers = 2 : 5

She gives each of her **four** brothers the **same** amount.

Does each brother receive more than £430 ?

You **must** show your working.

[4 marks]

Total ratio : 2 + 5 = 7

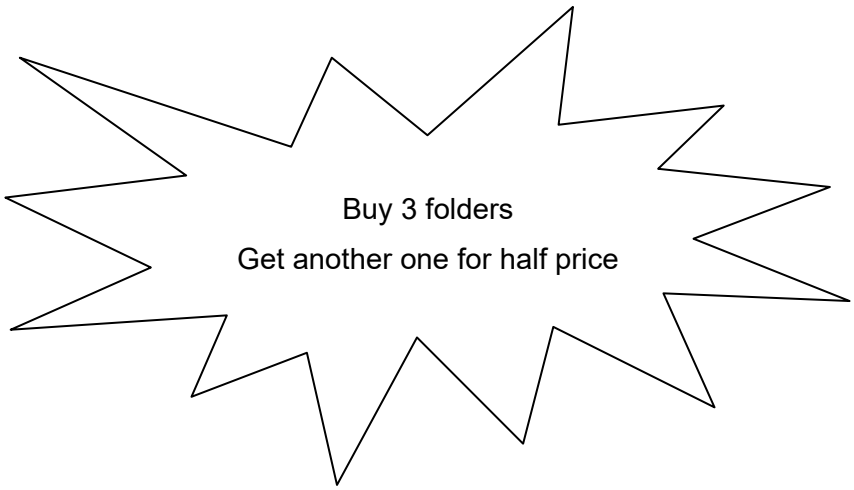
money she gives : $\frac{5}{7} \times 2450 = 1750$ (1) (1)

Each brother receive : $\frac{1750}{4} = 437.50$ (1)

Yes. Each receive £437.50. (1)

24 (a) The shop also sells folders for £3.20 each.

The shop has this offer.



Work out the cost of 4 folders using the offer.

[3 marks]

$3 \times 3.20 + \frac{1}{2} \times 3.20$ (1) (1)

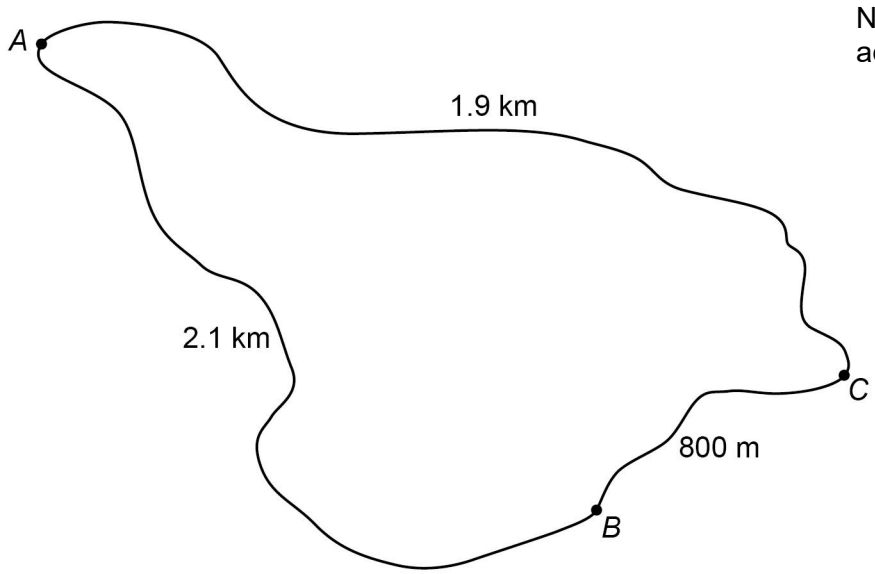
$= 9.60 + 1.60$

$= 11.20$ (1)

Answer £ 11.20

25 (a) *A*, *B* and *C* are connected by paths.

The length of each path is shown.



Not drawn accurately

Nathan and Sue each walk from *A* to *B*.

Nathan walks along the path $A \rightarrow B$

Sue walks along the paths $A \rightarrow C \rightarrow B$

How much **further** does Sue walk than Nathan?

Give your answer in kilometres.

[3 marks]

Sue : 1.9 + 0.8 (1) = 2.7 km

Nathan : 2.1 km

(1)

2.7 − 2.1 = 0.6 km

Answer 0.6 (1) km

26 Hamish has saved 295 coins.

Each one is a 20p coin.

He gives an equal number of 20p coins to each of his 8 grandchildren.

He gives them as many coins as possible.

How much, in £, does he have left?

[4 marks]

$295 \div 8 = 36.875$ (1)

He gives each grandchild 36 coins

$36 \times 0.20 = £7.20$ each (1)

Total he gives : $£7.20 \times 8 = £57.60$

Total he has initially : $295 \times 0.20 = £59$ (1)

Total he has left : $59 - 57.60 = 1.40$ (1)

Answer £ 1.40

27 A football team plays two matches.

27 (a) For the first match, 40 000 tickets are sold.
Assume that each ticket costs £38.50

Work out the total amount of money from ticket sales for this match.

[2 marks]

40000 × 38.50 = 1 540 000 (1) (1)

Answer £ 1 540 000

27 (b) In fact, for the first match,

some of the tickets cost less than £38.50

and

some of the tickets cost more than £38.50

What does this mean about the total amount of money from ticket sales for this match?
Tick **one** box.

[1 mark]

- ☐ It will be more than the answer to part (a)
- ☐ It will be the same as the answer to part (a)
- ☐ It will be less than the answer to part (a)
- ☑ It is not possible to tell (1)

7 (c) For the second match, the number of tickets sold increases from 40 000 to 55 000

Is the increase in tickets sold **more** than 35% ?

You **must** show your working.

[3 marks]

55 000 − 40 000 = 15 000 (1)

$\frac{15\,000}{40000}$ (1) × 100% = 37.5% (1)

Yes. It is more than 35%.

28 A tank contains 40 litres of water.

28 (a) Water leaks out of the tank at a rate of 1.2 litres per minute.
The leak is stopped after 20 minutes.

Show that, when the leak is stopped, the tank contains 16 litres of water.

[1 mark]

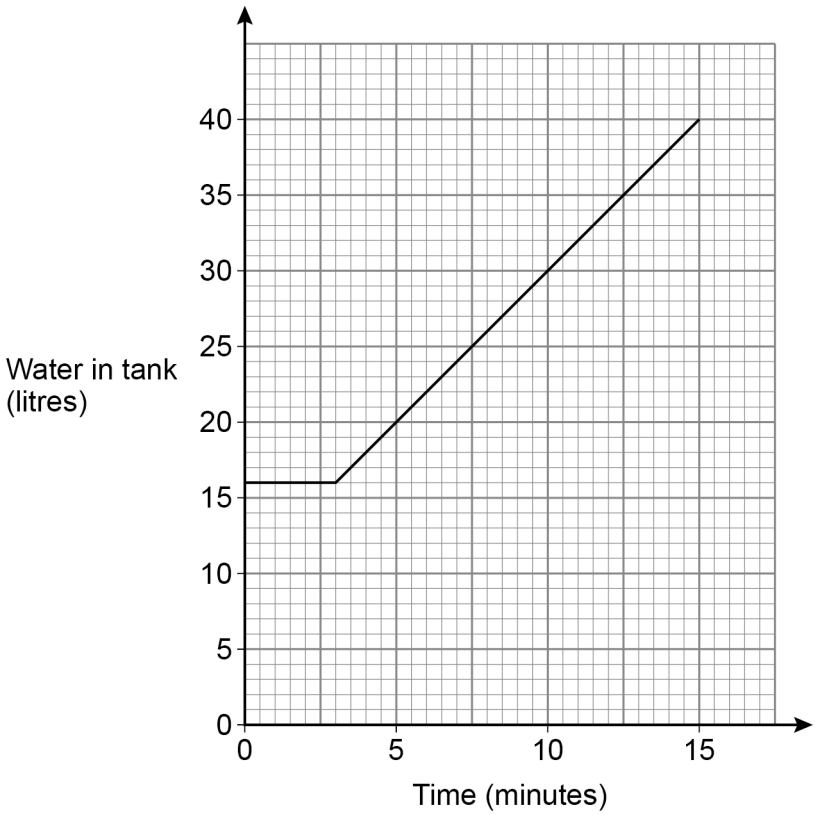
Total water leaks : $1.2 \times 20 = 24$ litres

(1)

$40 - 24 = 16$

28 (b) The tank is refilled with water from a tap.

The graph shows the amount of water in the tank **after** the leak is stopped.



Complete this report by writing a number in each answer space.

[3 marks]

Report

3 (1) minutes after the leak is stopped, the tap starts to refill the tank.

The rate at which the tank refills is 2 litres per minute.

$\frac{40-16}{15-3} = \frac{24}{12} = 2$ (1) (1)

29 11 identical full tins of red paint hold a total of 3630 ml

All the paint from 4 of these tins is poured into an empty bucket.

The bucket can hold 2500 ml

Tins of white paint each hold 140 ml

Can all the white paint from 9 tins be added to the bucket?

You **must** show your working.

[4 marks]

1 full tin of red paint = $\frac{3630 \text{ ml}}{11}$ = 330 ml (1)

4 tins of red paint = 330 ml × 4 = 1320 ml (1)

Balance the bucket can hold: 2500 ml − 1320 ml = 1180 ml (1)

Tins of white paint to be added into the bucket: $\frac{1180 \text{ ml}}{140 \text{ ml}}$ = 8.42... (1)

No. Not all 9 tins can be added.

30 (a) At the restaurant, dough balls can be ordered in small portions and large portions.

Small portion	**Large portion**
6 dough balls	10 dough balls

A group of people want to order **exactly** 44 dough balls.

Show how they can do this.

[2 marks]

$(4 \times 6) + (2 \times 10)$

$= 24 + 20$ ✓(1)

$= 44$

Number of Small portions 4

Number of Large portions 2 ✓(1)

31

Apples	25p each
Oranges	60p each

Salma has £10 to buy apples and oranges.

She buys

9 apples

and

as many oranges as possible.

How many oranges does she buy?

[4 marks]

Apples : $9 \times 25p = £2.25$ ✓(1)

Balance to buy orange : $£10 - £2.25$

$= £7.75$ ✓(1)

How many oranges ? : $£7.75 \div £0.60$ ✓(1)

$$\begin{array}{r} 12 \\ 60\overline{)775} \\ -60 \\ \hline 175 \\ -120 \\ \hline 55 \end{array}$$

: She can only buy 12 oranges.

Answer 12 ✓(1)

32 (a) Leema buys 2 metres of linen at £8.50 per metre.

She also buys 5 metres of cotton.

The **total** cost is £38

What is the cost of **one** metre of cotton?

[4 marks]

Cost of linen : 2 × £8.50 = £17 ✓(1)

Cost of 5 metres of cotton : £38 − £17 ✓(1)

= £21

Cost of 1 metre of cotton : £21 ÷ 5 ✓(1)

= £4.20

Answer £ 4.20 ✓(1)

32 (b) Buttons cost 65p each.

The greatest number of buttons Leema can buy with £5 is 7

She says,

"The greatest number of buttons I can buy with £10 is 14 because £10 is double £5"

Is she correct?

Tick a box.

Yes ☐ No ☑

Show working to support your answer.

[2 marks]

£0·65 × 14 = £9·10 ✓(1)

£0·65 × 15 = £9·75

The highest number of buttons she can buy is 15 ✓(1)

33

- A pack of pegs costs 40p
- A bar of soap costs £2.20
- A basket costs £7

Dan buys **two** packs of pegs, **one** bar of soap and **one** basket.

What fraction of the total cost is the cost of the basket?

[3 marks]

Total cost : 2(£0.40) + £2.20 + £7 ✓1

= £0.80 + £2.20 + £7 ✓1

= £10

Fraction of basket's price to total price :

$\frac{7}{10}$

Answer $\frac{7}{10}$ ✓1

34 Kay hires a digger.

The cost per day is

- £24.50 for the first 5 days
- reduced by 20% for day 6
- the same as day 6 for day 7 onwards.

The **total** cost is £259.70

For how many days did Kay hire the digger?

You **must** show your working.

[5 marks]

$\frac{80}{100} \times £24.50 = £19.60$ ✓① ✓①

$5(24.50) + n(19.60) = 259.70$

$122.50 + 19.60n = 259.70$ ✓①

$19.60n = 137.20$

$n = \frac{137.20}{19.60}$ ✓①

$= 7$

Klay hires the digger for: $5 + 7$

$= 12$ days ✓①

Answer 12

35 Town A has

a population of 84 000

an area of 7 **square miles**.

Town B has a population density of 4695 people per **square kilometre**.

$$\text{Population density} = \frac{\text{population}}{\text{area}}$$

Which town has the greater population density?

Use 1 square mile = 2.6 square kilometres

Tick a box.

Town A ☐ Town B ☑

Show working to support your answer.

[3 marks]

Town A area = 7 × 2.6 square km

= 18.2 square km

Town A population density = $\frac{84000}{18.2}$ = 4615 people per square km (2)

∴ Town B has greater population density (1)