



Problem Solving with Number

Name: Answers

Class: _____

Time: 1 hour 20 mins

Total marks available: 70

Total marks achieved: _____

Q1.

Paul organised an event for a charity.

Each ticket for the event cost £19.95 \approx £20

Paul sold 395 tickets. \approx 400 tickets

Paul paid costs of £6000

He gave all money left to the charity.

(a) Work out an estimate for the amount of money Paul gave to the charity.

$$20 \times 400 - 6000 = 8000 - 6000 = 2000$$

£ 2000

(3)

(b) Is your answer to (a) an underestimate or an overestimate?
Give a reason for your answer.

Overestimate because both amounts
were rounded up to 1 s.f.

(1)

(Total for question = 4 marks)

Q2.

A unit of gas costs 4.2 pence. $\approx 4p$

On average Ria uses 50.1 units of gas a week. ≈ 50 units

She pays for the gas she uses in 13 weeks. ≈ 10 weeks

(a) Work out an estimate for the amount Ria pays.

$$4 \times 50 \times 10 = 2000p = \pounds 20$$

$\pounds 20$

(3)

(b) Is your estimate to part (a) an underestimate or an overestimate?
Give a reason for your answer.

Underestimate because all amounts were rounded down to 1 s.f.

(1)

(Total for question is 4 marks)

Q3.

Tom and Amy set the alarms on their phones to sound at 6.45 am.

Both alarms sound together at 6.45 am.

Tom's alarm then sounds every 9 minutes.

Amy's alarm then sounds every 12 minutes.

At what time will both alarms next sound together?

Tom \rightarrow 9, 18, 27, 36, 45...

Amy \rightarrow 12, 24, 36, 48...

36 mins later

6:45 am + 36 mins = 7:21 am

.....
7:21 am

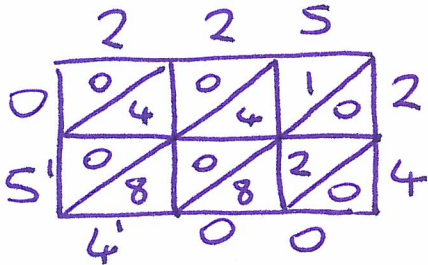
(Total for question = 3 marks)

Q4.

Dan buys 24 packets of nuts.
Each packet of nuts weighs 225 g.

(a) Work out the total weight of all the packets of nuts that Dan buys.

$$24 \times 225 = 5400\text{g} = 5.4\text{kg}$$



(2)

Susan is going to have a party.
There will be 50 people at the party.

Susan wants to buy enough sausages so that each person at the party can have 2 sausages.

There are 8 sausages in each pack.
Susan buys 12 packs of sausages.

(b) Has she bought enough sausages?

$$50 \times 2 = 100 \text{ sausages needed.}$$

$$8 \times 12 = 96 \text{ sausages bought.}$$

Susan has not bought enough sausages.

(3)

(Total for question = 5 marks)

Q5.

The table gives information about the cost of cinema tickets.

Cinema tickets	Before 5pm	5pm and after	
adult ticket	£6.35	£7.55	x 2
child ticket (ages 2 – 12)	£4.75	£5.65	x 1
teen ticket (ages 13 – 18)	£5.05	£6.05	x 1
family ticket (for 4 people)	£19.00	£22.60	

Mr and Mrs White have 2 children.

One child is aged 10

The other child is aged 14

Mr and Mrs White and their 2 children go to the cinema **after** 5pm.

It is cheaper for Mr and Mrs White to buy 1 family ticket than to buy 4 separate tickets.

How much cheaper?

$$\begin{array}{r} 7.55 \\ 7.55 \\ 5.65 \\ 6.05 + \\ \hline \pounds 26.80 \\ \begin{array}{l} 1 \\ 2 \end{array} \end{array}$$

$$\begin{array}{r} 26.80 \\ 22.60 - \\ \hline \pounds 4.20 \end{array}$$

£ 4.20

(Total for Question is 4 marks)

Q6.

* Sandeep and her 3 friends are going shopping in town.

Sandeep finds out these costs of getting to town.

Tram £3.50 each

Taxi £2.20 booking fee plus £1.20 per mile

The journey to town is 10 miles.

Is it cheaper for all 4 people to go to town by tram or to go to town by taxi?
You must show your working.

$$4 \times £3.50 = £14 \text{ (tram)}$$

$$10 \times £1.20 + £2.20 = £14.20 \text{ (taxi)}$$

It is cheaper to travel by tram.

(Total for question = 4 marks)

Q7.

Priya and Amit are going on holiday with their 3 children.

The table gives information about the cost of travel and the cost of the hotel.

Travel	Each adult	£60
	Each child	£50
Hotel	Room for 2 adults	£45 per night
	Room for 3 children	£55 per night

Priya and Amit have saved £1500 for their holiday.
They will be away for 7 nights.

Work out how much of the £1500 they will have left to spend on their holiday.

$$\begin{aligned}£45 \times 7 &= £315 \\£55 \times 7 &= £385 \\£60 \times 2 &= £120 \\£50 \times 3 &= £150 + \\ &\underline{\quad\quad\quad} \\ &£970\end{aligned}$$

$$£1500 - £970 = £530$$

£.....530.....

(Total for Question is 4 marks)

Q8.

* Jerry is making some shelves.

He needs

5 pieces of wood of length 65 cm

2 pieces of wood of length 110 cm.

The wood is sold in three different lengths.

Information about these lengths is shown in the table.

Length	Cost
100 cm	£21
150 cm	£25
180 cm	£28

Jerry wants to pay as little money as possible.

How much will Jerry have to pay?

You must show your working.

$$65 + 110 = 175 \text{ cm}$$

$$2 \times £28 = £56$$

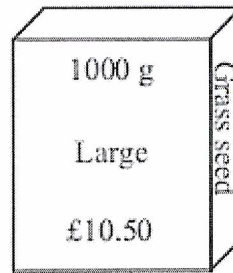
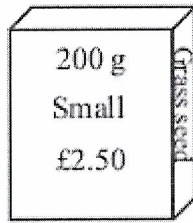
$$2 \times 65 = 130 \text{ cm}$$

$$£56 + £25 + £21 = £102$$

(Total for Question is 4 marks)

Q9.

* Nilmini is going to buy some grass seed.



Grass seed is sold

in 200 g boxes costing £2.50 each,
in 1000 g boxes costing £10.50 each.

Which box of grass seed gives the better value for money?
You must show all your working.

$$\begin{aligned} \div 200 \text{ g } \quad 200 \text{ g} &= 250 \text{ p} \quad \div 200 & \div 1000 \text{ g } \quad 1000 \text{ g} &= 1050 \text{ p} \quad \div 1000 \\ 1 \text{ g} &= 1.25 \text{ p} & 1 \text{ g} &= 1.05 \text{ p} \end{aligned}$$

The large box is better value for money.

(Total for Question is 3 marks)

Q10.

*Milk is sold in two sizes of bottle.



A 4 pint bottle of milk costs £1.18

A 6 pint bottle of milk costs £1.74

Which bottle of milk is the best value for money?

You must show all your working.

$$\begin{array}{l} \div 4 \left\{ \begin{array}{l} 4 \text{ pints} = 118\text{p} \\ 1 \text{ pint} = 29.5\text{p} \end{array} \right. \div 4 \quad \div 6 \left\{ \begin{array}{l} 6 \text{ pints} = 174\text{p} \\ 1 \text{ pint} = 29\text{p} \end{array} \right. \div 6 \end{array}$$

The large bottle is better value for money.

(Total for Question is 3 marks)

Q11.

Miss Martins is organising a school play.

The total cost of putting on the play is £960

The school pays £300 of this cost.

Miss Martins sells tickets to pay the rest of the cost.

Miss Martins sells 500 tickets.

Each ticket costs £4

Miss Martins has enough money to pay the rest of the costs and to give all the money left over to charity.

Work out how much money Miss Martins gives to charity.

$$500 \times £4 = £2000$$

$$£960 - £300 = £660$$

$$£2000 - £660 = £1340$$

£ 1340

(Total for Question is 4 marks)

Q12.

Here are the ticket prices for entry to a museum.

Ticket prices Adult ticket £12 Child ticket £7 Senior ticket £8 Family ticket (2 adult tickets and 2 child tickets) £30
--

Shamus takes his family to the museum.

He gets tickets for

2 adults,
3 children,
1 senior.

Shamus pays the least possible amount of money for the tickets.
He pays with three £20 notes.

How much change should he get?

$$\begin{array}{r} \text{Family} \rightarrow \pounds 30 \\ \text{Child} \rightarrow \pounds 7 \\ \text{Senior} \rightarrow \pounds 8 + \\ \hline \pounds 45 \end{array}$$

$$3 \times \pounds 20 = \pounds 60$$

$$\pounds 60 - \pounds 45 = \pounds 15$$

£.....15.....

(Total for Question is 4 marks)

Q13.

* Aleena is planning a trip for people at her Youth Club.

Here are the costs for the trip.

Transport	£230
Insurance	£50
Other costs	£30
Entry fee	£14 per person

Aleena charges £18 per ticket for the trip.

She sells 100 tickets.

Is there enough money from the ticket sales for Aleena to pay all the costs for the trip?

You must show your working.

$$\begin{array}{r} 100 \times £14 = £1400 \\ 230 \\ 50 \\ 30+ \\ \hline £1710 \text{ needed} \end{array}$$

$$100 \times £18 = £1800$$

There is enough money to cover all costs.

(Total for Question is 4 marks)

Q14.

John buys some boxes of pencils and some packets of pens for people to use at a conference.

There are 40 pencils in a box.

There are 15 pens in a packet.

John gives one pencil and one pen to each person at the conference.

He has no pencils left.

He has no pens left.

How many boxes of pencils and how many packets of pens did John buy?

Pencils \rightarrow 40, 80, 120, 160, 200...

Pens \rightarrow 15, 30, 45, 60, 75, 90, 105, 120...

..... 3 boxes of pencils

..... 8 packets of pens

(Total for question = 3 marks)

Q15.

Sarah has saved 254 pound coins.
She puts the pound coins into bags.
There are 20 pound coins in each full bag of coins.

Sarah is going to take all her full bags of coins to the bank.
She can only take up to 5 full bags of coins to the bank each day.

Sarah wants to go to the bank on as few days as possible.

On how many days will Sarah need to go to the bank?

$$240 \div 20 = 12 \text{ r } 14 = 13 \text{ bags}$$

$$13 \div 5 = 2 \text{ r } 3 = 3 \text{ days}$$

.....
3 days

(Total for Question is 3 marks)

Q16.

A ticket for a seat at a school play costs £2.95 \approx £3

There are 21 rows of seats. \approx 20

There are 39 seats in each row. \approx 40

The school will sell all the tickets.

Work out an estimate for the total money the school will get.

$$20 \times 40 \times \text{£}3 = \text{£}2400$$

£ 2400

(Total for Question is 3 marks)

Q17.

Sally uses her van to deliver boxes to shops.
She can put a maximum weight of 450 kg in the van.

Sally has to deliver 50 boxes to a shop.
Each box has a weight of 30 kg.

Work out the least number of times Sally has to drive to the shop to deliver all 50 boxes.
You must show all your working.

$$50 \times 30 = 1500 \text{ kg}$$

$$\frac{1500}{450} = \frac{30}{9} = 3\frac{1}{3}$$

4 times

(Total for Question is 3 marks)

Q18.

Mr Morris is going to take his family to the zoo.

Ticket prices (per person)

Adult	£16.50
Child (3 – 14)	£13.50
Child (under 3)	free

Mr Morris wants to buy tickets for two adults and two children aged 2 and 4

(a) How much in total will the tickets cost?

$$\begin{array}{r} 16.50 \\ 16.50 \\ \hline 13.50 + \\ \hline 46.50 \\ \text{''} \end{array}$$

£. 46.50

(2)

Mr Morris pays with three £20 notes.

(b) How much change should he get?

$$\begin{aligned} 3 \times 20 &= £60 \\ £60 - £46.50 &= £13.50 \end{aligned}$$

£. 13.50

(2)

(Total for Question is 4 marks)

Q19.

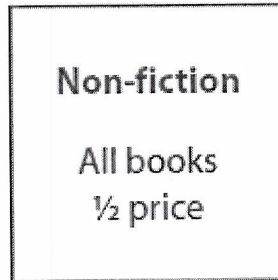
Helen has 80 books to sell.

Each book is Fiction or Non-fiction.

The ratio of the number of Fiction books to the number of Non-fiction books is 3:1

Each book has a normal price of £10

Helen reduces the price of all the Non-fiction books.



Helen sells all 80 books.

Work out the total amount of money Helen will receive.

$$\begin{aligned}80 \div 4 &= 20 \text{ (1 part)} \\3 \times 20 &= 60 \text{ fiction} \\1 \times 20 &= 20 \text{ non-fiction} \\60 \times £10 &= £600 \\20 \times £5 &= \underline{£100} + \\&£700\end{aligned}$$

£ 700

(Total for question = 4 marks)