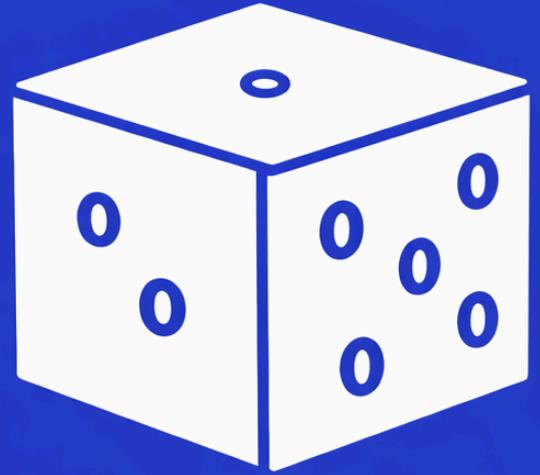


GCSE Foundation Worked Solutions 2a

LUCKY MATHS



More papers



Solutions



Instructions

Use black ink or ball-point pen.

Draw diagrams in pencil.

Write your answers in the spaces provided and show all working.

The total mark for this paper is 80



Materials

Black pen

Pencil

Ruler

Disclaimer:

The practice papers created by Lucky Maths are designed for revision and educational support only.

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Answer ALL questions.
Write your answers in the spaces provided.
You must write down all the stages in your working.

1 Write the number **4020** in words.

Four thousand and twenty

(Total for Question 1 is 1 mark)

2 Which one of the numbers below is an **even number**.

17 28 35 41

28

(Total for Question 2 is 1 mark)

3 What is the value of the digit **5** in the number **7.53**?

0.5 or tenths

(Total for Question 3 is 1 mark)

4 Work out the perimeter of a square with side length **5 cm**.

$$5 + 5 + 5 + 5 = 20 \text{ cm}$$

or

$$5 \times 4 = 20 \text{ cm}$$

20 cm

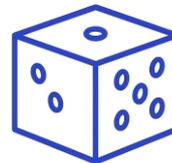
(Total for Question 4 is 1 mark)

5 Shade **one quarter** of the rectangle below.



$$\frac{8}{4} = 2$$

(Total for Question 5 is 1 mark)



6 A shape has **one pair of parallel sides**.

(a) What is the **name** of this shape?

Trapezium

(1)

(b) **Draw** the shape below:



(1)

(Total for Question 6 is 2 marks)

7 Write down **three different factors of 24**.

24

$$1 \times 24$$

$$2 \times 12$$

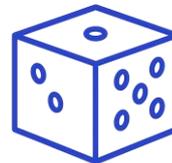
$$3 \times 8$$

$$4 \times 6$$

1, 2, 3, 4, 6, 8, 12 or 24

(2)

(Total for Question 7 is 2 marks)



8 A group of students were asked what their **favourite pet** is.

The results are shown in the **tally chart** below.

Pet	Tally
Dog	
Cat	
Fish	
Rabbit	

(a) How many people chose **Dog** as their favourite pet?

4

(1)

(b) Which pet was chosen the **most**, and **how many more** votes did it get than **Fish**?

$$10 - 7 = 3$$

Rabbit + 3

(2)

(Total for Question 8 is 3 marks)

9 A bicycle wheel has a **radius** of 7 cm.

Work out the **circumference** of the wheel.

Give your answer **in terms of π**

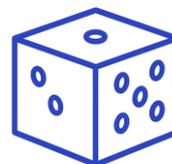
$$C = 2\pi r$$

$$2\pi \times 7 = 14\pi$$

14 π cm

(2)

(Total for Question 9 is 2 marks)



10 A bottle contains **1.25 litres** of water.

(a) Convert **1.25 litres** into **millilitres**.

$$1 \text{ L} = 1000 \text{ ml}$$

$$1.25 \times 1000 = 1250$$

.....
1250 ml

(1)

(b) A student drinks **350 ml** from the bottle.

How much water is left in **litres**?

$$1250 - 350 = 900 \text{ ml}$$

$$900 \text{ ml} = 0.9 \text{ L}$$

.....
0.9 L

(1)

(Total for Question 10 is 2 marks)

11 A teacher has a box containing **8 pencils**, **5 pens**, and **7 highlighters**.

(a) A student picks **one** item at **random**.

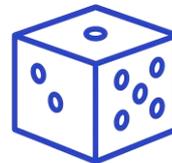
What is the **probability** that the student picks a **pen**?

$$8 + 5 + 7 = 20$$

$$\frac{5}{20} = \frac{1}{4}$$

.....
 $\frac{1}{4}$

(1)



(b) The chosen item is **not replaced**.

A **second** student picks **another item** from the box.

What is the **probability** that the second student picks a **highlighter**?

$$8 + 5 + 7 = 20$$

$$\frac{7}{19}$$

(2)

(Total for Question 11 is 3 marks)

12 The temperature in **Boston** one morning is -3°C .

Later that day, the temperature in **Northampton** is 5°C higher than in Boston.

(a) What is the temperature in **Northampton**?

$$-3 + 5 = 2$$

$$2^{\circ}\text{C}$$

(1)

Later that night, the temperature in Boston **falls by** 7°C .

(b) Work out **Boston's new temperature**.

$$-3 - 7 = -10^{\circ}\text{C}$$

$$-10^{\circ}\text{C}$$

(1)

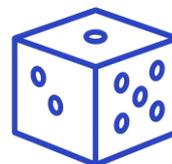
(c) What is the **difference** in temperature between **Northampton** and **Boston** at night?

$$2 \overset{+}{-} 10 = 2 + 10 = 12$$

$$12^{\circ}\text{C}$$

(1)

(Total for Question 12 is 3 marks)



13 A bus timetable is shown below:

Stop	Arrival Time
Boston	09:15
Wyberton	09:23
Sleaford	09:48
Northampton	10:32

(a) How long does the bus take to travel from **Boston** to **Wyberton**?

$$09:23 - 09:15 = 8 \text{ minutes}$$

8 minutes

(1)

(b) How long does the bus take to travel from **Wyberton** to **Northampton**?

$$09:23 - 10:23 = 1 \text{ hour}$$
$$10:23 - 10:32 = 9 \text{ minutes}$$

1 hour 9 mins

(1)

A passenger gets on the bus at **Sleaford**.

(c) The journey to Northampton takes **44 minutes**.

Check if this is **correct** using the **timetable**.

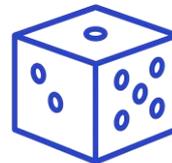
$$09:48 - 10:00 = 12 \text{ minutes}$$
$$10:00 - 10:32 = 32 \text{ minutes}$$

$$12 + 32 = 44.$$

44 minutes
 \therefore yes

(1)

(Total for Question 13 is 3 marks)



14 A gardener buys x packets of seeds.

Each packet costs £3, and she also pays a delivery fee of £5.

(a) Write an expression for the total cost, in pounds, in terms of x .

$$3x + 5$$

(1)

(b) Work out the **total cost** when she buys **7 packets** of seeds.

$$\begin{aligned} 3 \times 7 + 5 \\ 21 + 5 = 26 \end{aligned}$$

$$£26$$

(1)

(c) The gardener spends £41 altogether.

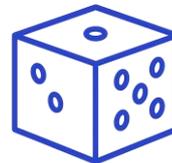
Work out **how many** packets of seeds she bought.

$$\begin{aligned} 3x + 5 &= 41 \\ -5 \quad -5 \\ \hline 3x &= 36 \\ \div 3 \quad \div 3 \\ x &= 12 \end{aligned}$$

$$x = 12$$

(1)

(Total for Question 14 is 3 marks)



15 A shop sells bottles of orange juice in two different offers:

Offer A

4 bottles for **£5.20**

Offer B

7 bottles for **£8.33**

(a) Work out the cost of **one bottle** for each offer.

$$\textcircled{A} \quad \frac{5.20}{4} = 1.30$$

$$\textcircled{B} \quad \frac{8.33}{7} = 1.19$$

$$A = \text{£}1.30$$

$$B = \text{£}1.19$$

.....
(2)

(b) Which offer gives the **best** value?

Give a **reason** for your answer.

B is cheaper

(2)

(Total for Question 15 is 4 marks)

16 At the end of **January**, Brad's electricity meter reads **102,564 kWh**.

At the end of **February**, his electricity meter reads **104,129 kWh**.

Each kWh of electricity Brad uses costs **18p**.

Work out how much Brad had to pay for the electricity he used in February.

$$104,129 - 102,564 = 1,565 \text{ kWh}$$

$$1565 \times 18\text{p} = 28,170\text{p}$$

$$28,170 = \text{£}281.70$$

$$\text{£}281.70$$

.....
(4)

(Total for Question 16 is 4 marks)



17 A formula is given as: $y = 3a + 4b$

(a) Work out the value of y when: $a = 2$ and $b = 5$

$$\begin{aligned} 3 \times 2 &= 6 \\ 4 \times 5 &= 20 \end{aligned}$$

$$y = 6 + 20 = 26$$

..... 26

(2)

(a) Work out the value of y when: $a = -3$ and $b = 7$

$$\begin{aligned} 3 \times -3 &= -9 \\ 4 \times 7 &= 28 \end{aligned}$$

$$y = -9 + 28 = 19$$

..... 19

(2)

(Total for Question 17 is 4 marks)

18 Oreo the dog has **48 treats** in his treat jar.

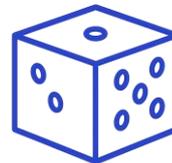
(a) Oreo eats $\frac{1}{4}$ of the treats.

How many treats does Oreo eat?

$$\frac{1}{4} \times 48 = \frac{48}{4} = 12$$

..... 12 treats

(1)



(b) Later in the day, Oreo eats $\frac{1}{3}$ of the treats he has left.

How many **more** treats does he eat?

$$\frac{1}{3} \times 36 = 12$$

.....12.....

(2)

(Total for Question 18 is 3 marks)

19 Abbie is making a batch of **white chocolate chip muffins**.

The recipe for **12 muffins** is shown below:

- **180 g** self-raising flour
- **120 g** sugar
- **90 g** butter
- **150 ml** milk
- **100 g** white chocolate chips

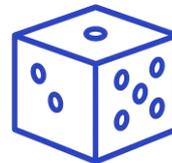
(a) Abbie wants to make **18 muffins**.

Work out how much **flour** and how many **white chocolate chips** she will need.

$$180 \times 1.5 = 270g$$
$$100 \times 1.5 = 150g$$

Flour:.....270.....g
White Chocolate Chips:.....150.....g

(2)



(b) Abbie only has **75 g** of white chocolate chips.

What is the **maximum** number of muffins she can make?

Show your working.

$$\frac{100}{12} \approx 8.33g$$

$$\frac{75}{8.33} = 9$$

.....9 muffins.....

(2)

(Total for Question 19 is 4 marks)

20 A theme park charges **£8** for entry plus **£3** per ride.

(a) Write an **inequality** to show the number of rides, r , Albert can go on if he has **no more** than £26 to spend.

$$8 + 3r \leq 26$$

..... $8 + 3r \leq 26$

(2)

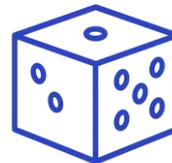
(b) Solve your inequality to find the **maximum number of rides** Albert can go on.

$$\begin{array}{r} 8 + 3r \leq 26 \\ -8 \qquad \qquad -8 \\ \hline 3r \leq 18 \\ \div 3 \quad \left(\begin{array}{l} 3r \leq 18 \\ r \leq 6 \end{array} \right) \div 3 \end{array}$$

.....6 rides.....

(2)

(Total for Question 20 is 4 marks)



21 A recipe for smoothie mix uses ingredients in the ratio:

Bananas : Strawberries : Yogurt = 3 : 5 : 2

Alice wants to make a large batch of smoothie mix using **1.2 kg of strawberries**.

(a) Work out how much **banana** she needs.

$$5 \text{ parts} = 1.2 \text{ kg}$$

$$\frac{1.2}{5} = 0.24 \text{ kg}$$

$$3 \times 0.24 = 0.72 \text{ kg}$$

.....0.72 kg.....

(2)

(b) Work out the **total mass** of the smoothie mix Alice will make.

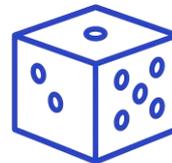
$$2 \times 0.24 = 0.48 \text{ kg}$$

$$0.72 + 1.2 + 0.48 = 2.4 \text{ kg}$$

.....2.4 kg.....

(2)

(Total for Question 21 is 4 marks)



22 A regular polygon has an exterior angle of 24° .

(a) Work out the number of sides the polygon has.

$$\frac{360}{24} = 15$$

.....15 sides.....

(2)

The same polygon has an interior angle of $(3x + 12)^\circ$.

(b) Work out the value of x .

180 - Exterior angle

$$180 - 24 = 156$$

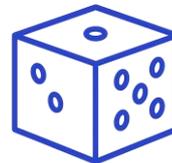
$$\begin{array}{r} 3x + 12 = 156 \\ - 12 \quad - 12 \\ \hline \end{array}$$

$$\begin{array}{l} \div 3 \left(3x = 144 \right) \div 3 \\ \quad \downarrow \quad \quad \quad \quad \quad \downarrow \\ \quad x = 48 \end{array}$$

..... $x = 48$

(2)

(Total for Question 22 is 4 marks)



23 Mr James Maths Tuition are preparing worksheets for their students.

They print **48 worksheets**.

They give $\frac{3}{8}$ of them to their Year 7 group and **12** worksheets to their Year 11 group.

(a) How many worksheets do they give to their Year 7 group?

$$\frac{3}{8} \times 48$$

$$48 \div 8 = 6$$

$$6 \times 3 = 18$$

18 worksheets

(1)

(b) How many worksheets do they **have left** after giving worksheets to Year 7 and Year 11?

$$18 + 12 = 30$$

$$48 - 30 = 18$$

18 worksheets

(2)

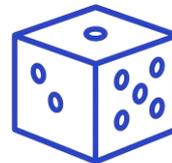
(Total for Question 23 is 3 marks)

24 Write down the **value** of $\cos 60^\circ$.

$$\frac{1}{2}$$

(1)

(Total for Question 24 is 1 marks)



25 A laptop is placed on sale with **20% off** its **original price**.

In the sale, the laptop costs **£80**.

(a) Work out the **original price** of the laptop.

$$\frac{80}{0.8} = 100$$

£100

(2)

After the sale, the shop **increases** the **original price** of the laptop by **15%**.

(b) Work out the **new price** of the laptop after this **increase**.

$$100 \times 1.15 = 115$$

£115

(2)

A customer has a **voucher** that gives **8%** off the new **increased** price.

(c) Work out how much the customer pays using the voucher.

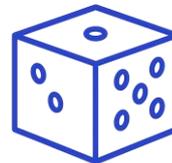
$$115 \times 0.08 = 9.20$$

$$115 - 9.20 = 105.80$$

£105.80

(2)

(Total for Question 25 is 6 marks)



- 26 While on holiday, Lily changes some money.

The **exchange rate** is:

$$£1 = 1.50 \text{ euros}$$

Lily changes **£120** into euros and then spends **€70** while she is away.

When she returns home, she changes all of her remaining euros back into pounds at the new exchange rate:

$$1 \text{ euro} = £0.50$$

Work out how many **pounds** Lily receives when she changes her remaining **euros** back into pounds.

$$120 \times 1.5 = 180 \text{ euros}$$

$$180 - 70 = 110 \text{ euros}$$

$$1 \text{ euro} = £0.50$$

$$110 \times 0.50 = 55$$

..... **£55**

(3)

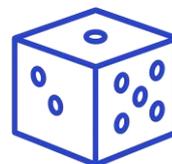
(Total for Question 26 is 3 marks)

- 27 Complete the table below by converting each value into a **fraction**, **decimal**, and **percentage**.

Fraction	Decimal	Percentage
$\frac{2}{5}$	0.4	40%
$\frac{37}{100}$	0.37	37%
$\frac{62}{100} = \frac{31}{50}$	0.62	62%

(4)

(Total for Question 27 is 4 marks)



28 A teacher recorded the **number of hours** her students revised in **one week**.

The results are shown in the **frequency table** below:

Hours Revised	1	2	3	4	5
Frequency	4	6	3	5	2
	4	12	9	20	10

(a) Work out the **mean number of hours** revised.

$$4 + 12 + 9 + 20 + 10 = 55$$

$$4 + 6 + 3 + 5 + 2 = 20$$

$$\frac{55}{20} = 2.75$$

..... 2.75

(2)

(b) Write down the **mode**.

↑
Most Common

..... 2 hours

(1)

(c) Work out the **median** number of hours revised.

$$\frac{20 + 1}{2} = 10.5^{\text{th}} \text{ Value}$$

$$\begin{aligned} 10^{\text{th}} \text{ Value} &= 2 \\ 11^{\text{th}} \text{ Value} &= 3 \end{aligned}$$

$$\begin{aligned} 2 + 3 &= 5 \\ 5 \div 2 &= 2.5 \end{aligned}$$

..... 2.5 hours

(1)

(Total for Question 28 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS