GCSE Foundation Worked Solutions

Paper 3 - Set 1 Calculator

LUCKY MATHS

More papers

SCAN ME

SCAN ME

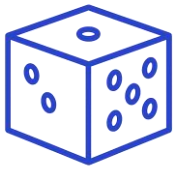
Solutions

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
Scientific Calculator



Answer ALL questions.
Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write down a **square number** between 20 and 40.

25 or 36

(Total for Question 1 is 1 mark)

---

2 Simplify: $\frac{2}{5} + \frac{1}{5}$

$\frac{3}{5}$

(Total for Question 2 is 1 mark)

---

3 Simplify: $3x + 2x$

$5x$

(Total for Question 3 is 1 mark)

---

4 Write the **next number** in this sequence:

4, 8, 12, 16, __

+4 +4

16 + 4 = 20

20

(Total for Question 4 is 1 mark)

---

5 Convert **500 cm** into **metres**.

100 cm = 1 m

500 ÷ 100 = 5

5 m

(Total for Question 5 is 1 mark)

---

6 A bus **leaves** at 10:45 am and **arrives** at 12:05 pm.

How **long** is the journey?

10:45 - 11:45 = 1 hour
11:45 - 12:05 = 20 minutes

1 hour + 20 mins

(2)

(Total for Question 6 is 2 marks)

---

7 Round **4.678** to **2 significant figures**

4.6|78
↑

4.7

(1)

(Total for Question 7 is 1 marks)

---

8 Work out: 45% of 180

0.45 x 180 = 81

81

(2)

(Total for Question 8 is 2 marks)

---

9 Write **0.047** as a **percentage**.

$0.047 \times 100 = 4.7\%$

4.7%

(1)

(Total for Question 9 is 1 marks)

---

10 Solve: $3(x + 4) = 30$

$3(x+4)=30$

$3x + 12 = 30$

$-12 \quad -12$

$3x = 18$

$\div 3 \quad \div 3$

$x = 6$

$x = 6$

(3)

(Total for Question 10 is 3 marks)

---

11 A bag contains **4 red**, **3 blue** and **1 green** counter.

What is the **probability** of picking a **blue** counter?

R : B : G

4 + 3 + 1 = 8

$\frac{3}{8}$

(3)

(Total for Question 11 is 3 marks)

---

12 Convert **3.5 km** into **metres**.

1 km = 1000 m

3.5 x 1000 = 3500

3500m

(1)

(Total for Question 12 is 1 marks)

---

13 A student records temperatures at 12 pm **each day**:

3°C, –1°C, 2°C, –4°C, 0°C

(a) Find the **range**

3 - -4 = 3 + 4 = 7

7°c

(1)

(b) Find the **mean temperature**

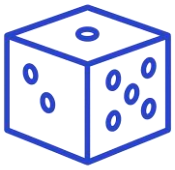
3 + -1 + 2 + -4 + 0 = 0

$\frac{0}{5} = 0$

0°c

(2)

(Total for Question 13 is 3 marks)



14 You are given the following information:

- Brad answered **30 questions** in total.
- Albert answered **26 questions** in total.
- Together, they answered **24 Algebra questions**.
- They answered **18 Number questions** altogether.
- Albert answered **8 Geometry questions**.
- Brad and Albert answer **the same number of Algebra questions.**

(a) Complete the two-way table.

	Algebra	Number	Geometry	Total
Brad	12	12	6	30
Albert	12	6	8	26
Total	24	18	14	56

(4)

(b) What **percentage** of the total were **Geometry** questions?

$\frac{14}{56} = \frac{1}{4} = 25\%$

25%

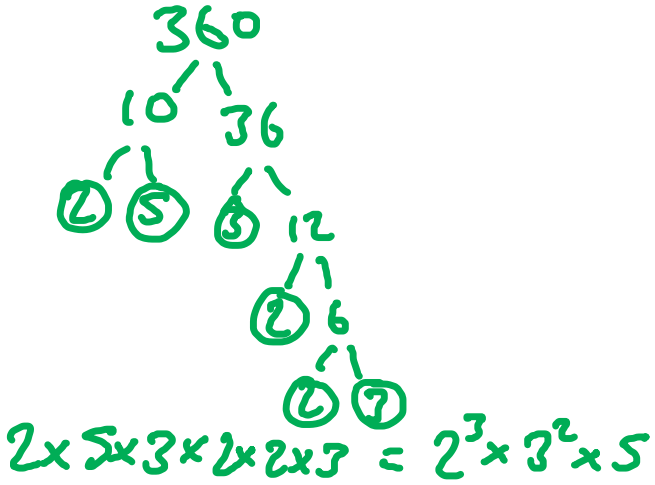
(2)

(Total for Question 14 is 6 marks)

15 Write **360** as a **product of its prime factors**.

Give your answer in **Index Form:**

Show your working clearly.



$2^3 \times 3^2 \times 5$

(3)

(Total for Question 15 is 3 marks)

---

16 Esmae cycles at a **constant speed**.

$S = \frac{d}{t}$

(a) She cycles **12 km** in **40 minutes**.

Work out her **speed in km/h**.

$\frac{40}{60} = 2.3$ hours

$\frac{12}{\frac{2}{3}} = 12 \times \frac{3}{2} = 18$

18 km/h

(2)

(b) Later, she **increases** her speed to **18 km/h**.

$T = \frac{d}{S}$

How long will it take her to travel **27 km** at this speed?

Give your answer in **minutes**.

$\frac{27}{18} = 1.5$

$1.5 \times 60 = 90$

90 minutes

(3)

(Total for Question 16 is 5 marks)

---

17 (a) Write **0.000482** in **standard form**.

4.82×10^{-4}

(1)

(b) Write **3.6×10^5** as an **ordinary number**.

360,000

(1)

(c) Calculate: $(3.2 \times 10^5) \div (8 \times 10^6)$.

Give your answer in **Standard Form**.

$3.2 \div 8 = 0.4$

$10^5 \div 10^6 = 10^{-1}$

$0.4 \times 10^{-1} = 4 \times 10^{-2}$

4×10^{-2}

(2)

(Total for Question 17 is 4 marks)

---

18 Work out: 18 – 6 ÷ 3 + 4 x 2

2

18 - 2 + 4 x 2

8

18 - 2 + 8

16 + 8 = 24

24

(2)

(Total for Question 18 is 2 marks)

---

19 A length is measured as **8.4 cm**, correct to **1 decimal place**.

Find the **upper bound** and **lower bound** of the actual length.

8.4 - 0.05 = 8.35cm

8.4 + 0.05 = 8.45cm

Lb = 8.35cm

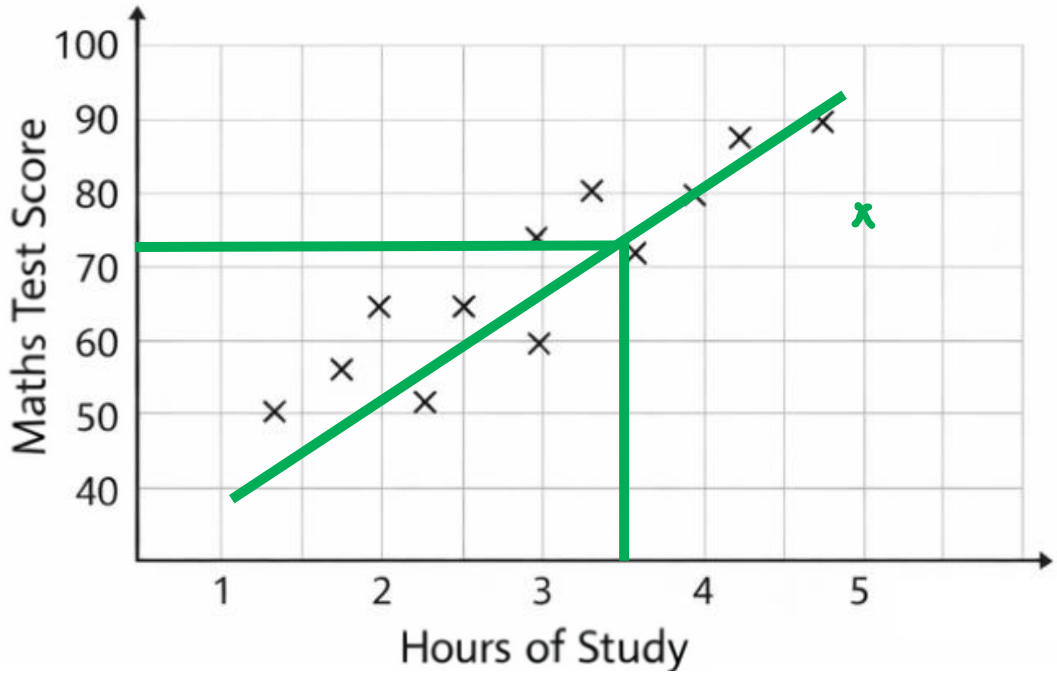
Ub = 8.45cm

(2)

(Total for Question 19 is 2 marks)

---

20 The scatter graph shows the maths test scores and hours of study for **10 students**.



(a) **Plot** the point (5, 78) on the graph.

(1)

(b) **Describe** the **correlation** shown on the graph.

Positive

(1)

(c) **Estimate** the maths score for a student who studied for **3.5 hours**.

72 - 75

(2)

(Total for Question 20 is 4 marks)

---

21 Mr Luck's students are learning about **3D shapes.**

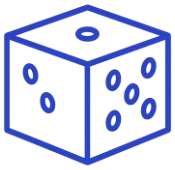
Complete the **table** for the following solids:

- **Cube**
- **Triangular prism**
- **Square-based pyramid**

3D Shape	Faces	Edges	Vertices
Cube	6	12	8
Triangular prism	5	9	6
Square-based pyramid	5	8	5

(4)

(Total for Question 21 is 4 marks)



22 **Simplify** the following **expressions**. Give each answer in **index form**.

(a) $3^4 \times 3^2$

3^{4+2}

3^6

(2)

(b) $\frac{5^7}{5^3}$

5^{7-3}

5^4

(2)

(Total for Question 22 is 4 marks)

---

23 Mr James records how many times a student gets a **head** when flipping a coin.

After **40 flips**, the student gets **17 heads**.

(a) Work out the **relative frequency** of getting a head.

$\frac{17}{40} = 0.425$

0.425

(2)

The student **continues** flipping the coin.

After a total of **100 flips**, the **relative frequency** of getting a head is **0.46**.

(b) How many **heads** did the student get in the **next 60 flips**?

$0.46 \times 100 = 46$ heads

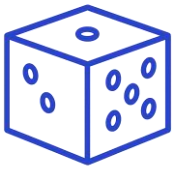
First flip = 17 heads

$46 - 17 = 29$

29 heads

(3)

(Total for Question 23 is 5 marks)



24 (a) Write down the **smallest prime number**.

2

(1)

(b) Circle **all** the **prime numbers** in the list below:

12 17 21 23 28 31

17, 23 and 31

(2)

(Total for Question 24 is 3 marks)

---

25 A closed cylindrical tin has a **radius of 5 cm** and a **height of 12 cm**.

Calculate the **total surface area** of the tin.

Give your answer in **cm²**, correct to **1 decimal place**.

Surface Area = $2\pi r^2 + 2\pi rh$

① $2 \times \pi \times 5^2 = 2\pi \times 25 = 50\pi$

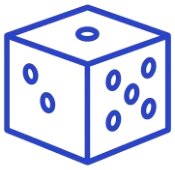
② $2\pi \times 5 \times 12 = 120\pi$

Total surface area = $50\pi + 120\pi = 170\pi$

534.1 cm^2

(4)

(Total for Question 25 is 4 marks)



26 A bag contains **3 different coloured counters**: **Red (R)**, **Blue (B)** and **Green (G)**.

Amira takes **two counters out of the bag, one after the other**, **without replacing** the first counter.

List all the possible outcomes Amira could get.

You should use a **systematic method** to make sure you find them all.

RB, RG
BR, BG
GR, GB

.....

(3)

(Total for Question 26 is 3 marks)

---

27 (a) **Expand** and **Simplify**: $(x + 4)(x + 6)$

x	x	$+4$
x	x^2	$+4x$
$+6$	$+6x$	$+24$

$x^2+4x+6x+24$

$x^2+10x+24$

(2)

(b) **Factorise** the following **expression** fully: $x^2 + 7x + 10$

↑ ↑
\+ x

$(x+5)(x+2)$

(3)

(Total for Question 27 is 5 marks)

---

28 Abbie is organising gift bags for a charity event.

- She has **48 sweets**, **36 stickers**, and **60 balloons**.
- She wants to make **identical gift bags**, using **all** the items, with **no leftovers**.

(a) What is the **greatest number of identical gift bags** Abbie can make?

48
1x48
2x24
3x16
4x12
6x8

36
1x36
2x18
3x12
4x9
6x6

60
1x60
2x30
3x20
4x15
5x12
6x10

12

(3)

(b) How many **sweets**, **stickers**, and **balloons** will be in each gift bag?

48÷12=4 (sweets)
36÷12=3 (stickers)
60÷12=5 (balloons)

4, 3 and 5

(2)

(Total for Question 28 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS