GCSE Foundation
Worked Solutions 3a

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

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

You must write down all the stages in your working.

1 **Solve** $5y = 35$

$\div 5 \{ 5y = 35 \} \div 5$
$y = 7$

$y = 7$

(Total for Question 1 is 1 mark)

---

2 Write a **prime number** between 1-10.

2, 3, 5 or 7

(Total for Question 2 is 1 mark)

---

3 Write 0.8 as a **fraction** in **simplest form**.

$\frac{8}{10} = \frac{4}{5}$

(Total for Question 3 is 1 mark)

---

4 Write the **value** of 9^2.

9×9

81

(Total for Question 4 is 1 mark)

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5 What is the **decimal** equivalent to 22%.

0.22

(Total for Question 5 is 1 mark)

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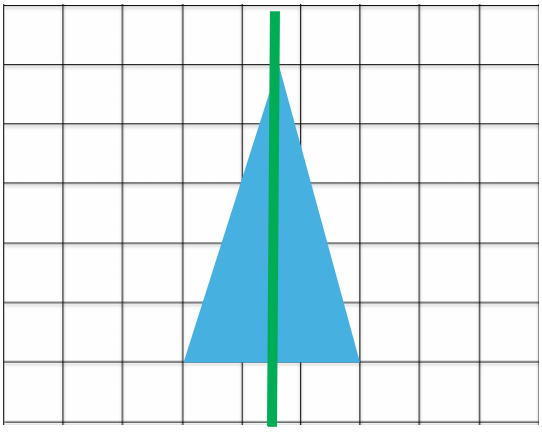
6 A shape is drawn on the grid below.



(a) What is the **special name** of this type of **triangle**?

Isosceles

(1)

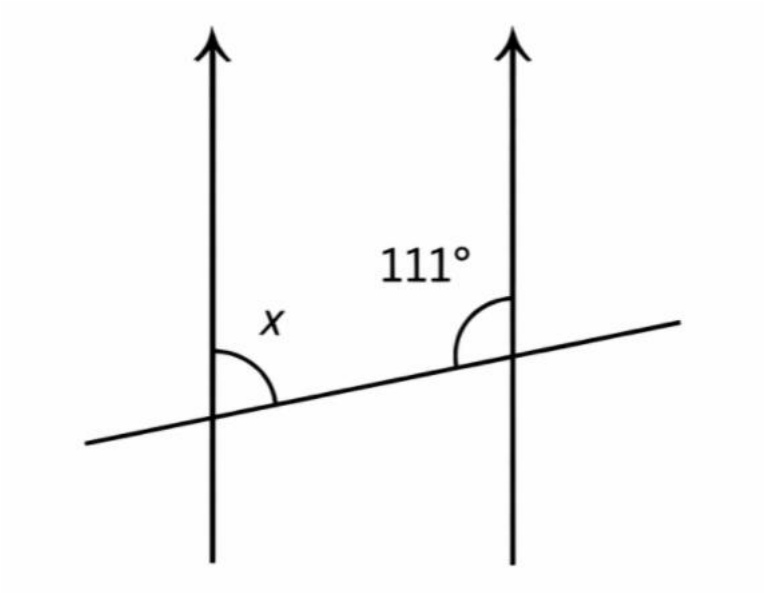
(b) How many lines of **symmetry** does this shape have?

1

(1)

(Total for Question 6 is 2 marks)

7 Below is an **angle**:



(a) Calculate the size of **angle** x.

180 - 111 = 69

69°

(1)

(b) Give a **reason** for your answer

Co-Interior angles sum to 180°

(1)

(Total for Question 7 is 2 marks)

8 Dottie and Ritchie share some money in the ratio **5 : 3**.

Dottie gives **£12** of her share to Ritchie.

After this, Dottie and Ritchie have **the same amount of money**.

Work out **how much** money they shared in total.

$5x - 12 = 3x + 12$

$-3x \quad -3x$

$2x - 12 = 12$

$+12 \quad +2$

$\div 2 \left(2x = 24 \right) \div 2$

$x = 12$

Dottie - $5 \times 12 = 60$

Ritchie - $3 \times 2 = 36$ +

96

£96

(3)

(Total for Question 8 is 3 marks)

---

9 Emily is thinking of a number, n.

She **multiplies** the number by **4**, then **subtracts 7**.

The result is **33**, what number is Emily thinking of?

$4n - 7 = 33$

$+7 \quad +7$

$\div 4 \left(4n = 40 \right) \div 4$

$n = 10$

10

(2)

(Total for Question 9 is 2 marks)

---

10 In a research simulation, there are **12 penguin models** placed in an artificial North Pole habitat.

- **7** of the penguins are **black-and-white**.
- The rest are **blue-tagged** for identification.

A penguin model is chosen at random.

(a) What is the **probability** that it is **blue-tagged**?

$12 - 7 = 5$

$\frac{5}{12}$

.....

(1)

(b) If two penguin models are chosen at random **with replacement**, what is the probability that **both** are black-and-white?

$\frac{7}{12} \times \frac{7}{12} = \frac{49}{144}$

$\frac{49}{144}$

.....

(2)

(Total for Question 10 is 3 marks)

---

11 A toy box contains **24 toys**.

9 of the toys are action figures, and the rest are teddy bears.

Later, **6 more teddy bears** are added to the box.

How many teddy bears are in the toy box now?

$24 - 9 = 15$

$15 + 6 = 21$

21

.....

(2)

(Total for Question 11 is 2 marks)

---

12 In a school assembly, $\frac{5}{8}$ of the students are sitting on the floor.

The rest are sitting on **chairs**.

Later, $\frac{1}{4}$ of the students who were sitting on **chairs** move to the **floor**.

What **fraction** of the students are now sitting on the **floor**?

Give your answer in its **simplest form**.

$\frac{1}{4} \times \frac{3}{8} = \frac{3}{32}$

$\frac{5}{8} + \frac{3}{32} = \frac{20}{32} + \frac{3}{32} = \frac{23}{32}$

$\frac{23}{32}$

(3)

(Total for Question 12 is 3 marks)

---

13 Work out: $\frac{3}{4} - \frac{2}{9} =$

$\frac{3}{4} - \frac{2}{9} = \frac{27}{36} - \frac{8}{36} = \frac{19}{36}$

$\frac{19}{36}$

(2)

(Total for Question 13 is 2 marks)

---

14 **Expand** and **simplify**:

$3(2x - 5) - (x + 7)$

$6x - 15 - x - 7$

$5x - 22$

$5x - 22$

(2)

(Total for Question 14 is 2 marks)

---

15 A school trip costs **£160**.

The price **increases** by **12%**.

What is the **new** price?

$12\% = \frac{12}{100} = 0.12$

$0.12 \times 160 = 19.2$

$160 + 19.2$

£179.20

(2)

(Total for Question 15 is 2 marks)

---

16 The temperature in a freezer is **–7°C**.

Over the next hour, the temperature **drops by 5°C**, then **increases by 11°C**.

Work out the final temperature in the freezer.

Show your working.

$-7-5=-12$

$-12+11=-1$

$-1°C$

(3)

(Total for Question 16 is 3 marks)

---

17 At Wyberton Bingo, each player is given a card with **15 numbers**.

There are **90 numbers** in the bingo machine.

During a game, **27 numbers** have already been called out.

What **fraction** of the numbers have **not been** called out yet?

Give your answer in its **simplest form**.

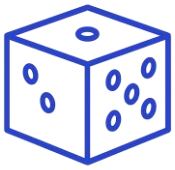
$90-27=63$

$\frac{63}{90} = \frac{7}{10}$ (÷9 ÷9)

$\frac{7}{10}$

(3)

(Total for Question 17 is 3 marks)



18 A student spins a fair-looking spinner **50 times** and records how many times it lands on **red**.

The spinner lands on red **18 times**.

(a) Work out the **relative frequency** of landing on red.

$\frac{18}{50} = \frac{9}{25}$ (÷2)

$\frac{9}{25}$

(1)

The student then **predicts** the results of spinning the same spinner **200 times**.

(b) Using your **relative frequency** from part (a), **estimate** how many times the spinner will land on **red** in **200 spins**.

$\frac{9}{25} \times 200$

$9 \times 8 = 72$

72 times

(2)

After doing the **200 spins**, the spinner actually lands on **red 60 times**.

(c) Comment on whether the relative frequency is becoming a better **estimate** of the **probability**.

Yes, the more trials, the more accurate the results will be.

(1)

(Total for Question 18 is 4 marks)

19 **Here is a list of numbers:**

38 39 40 41 42 43 44 49

From the list, **write down the square number**.

$7 \times 7 = 49.$

49

(1)

(Total for Question 19 is 1 marks)

---

20 Hannah's weight **decreases** from **72 kg** to **63 kg**.

Calculate the **percentage decrease** in Hannah's weight.

$72 - 63 = 9\text{kg}$

$\frac{9}{72} \times 100$

$0.125 \times 100 = 12.5\%.$

12.5%

(3)

(Total for Question 20 is 3 marks)

---

21 A bag contains **17 red** counters, 1**5 blue** counters and **14 green** counters.

One counter is taken at random.

What is the **probability** that the counter is **not red**?

17 + 15 + 14 = 46

15 + 14 = 29

$\frac{29}{46}$

.....

(2)

(Total for Question 21 is 2 marks)

---

22 Round each of the following numbers to the **given** amount of **significant figures.**

Number	1 s.f.	2 s.f.	3 s.f.
4829	5000	4800	4830
0.07351	0.07	0.074	0.0735
629.408	600	630	629

.....

(5)

(Total for Question 22 is 5 marks)

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23 A star is 3×10^4 **kilometres** away from a planet.

The planet is 2×10^2 **kilometres** in **diameter**.

(a) **Multiply** the two numbers to find: $(3 \times 10^4) \times (2 \times 10^2)$

Give your answer in **standard form**.

$3 \times 2 = 6$

$10^4 \times 10^2 = 10^6$

6×10^6

(2)

(b) Write **950 000** in **standard form**.

$950{,}000 = 9.5 \times 10^5$

9.5×10^5

(2)

(Total for Question 23 is 4 marks)

---

24 Write down the **value** of sin 30°.

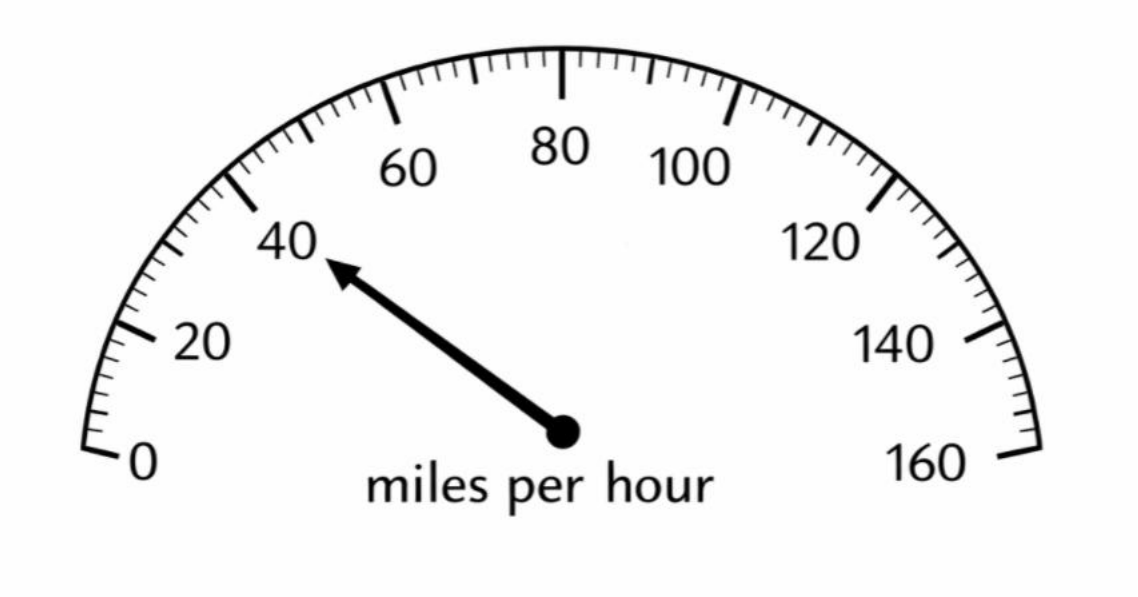
$\frac{1}{2}$

(1)

(Total for Question 24 is 1 marks)

---

25 The speedometer below shows the speed a car is travelling.



What **speed** is the car travelling at?

40 mph

(1)

The car then joins a motorway, the car travels at **65 miles per hour**.

The car continues at this speed for **1 hour 30 minutes**.

d = 5 x t

(b) How **far** does the car travel on the motorway?

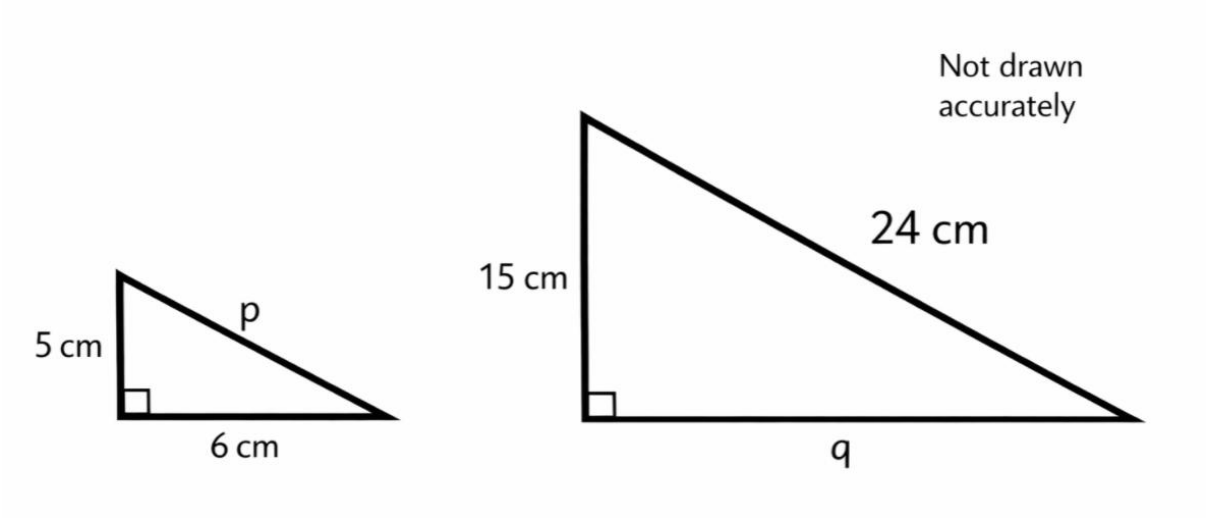
65 x 1.5 = 97.5

97.5 miles

(2)

(Total for Question 25 is 3 marks)

26 Shown below are two similar triangles:



(a) Find the size of **length q**.

$\frac{15}{5} = 3$

$6 \times 3 = 18$

.....18 cm.....

(2)

(b) Find the size of **length p**.

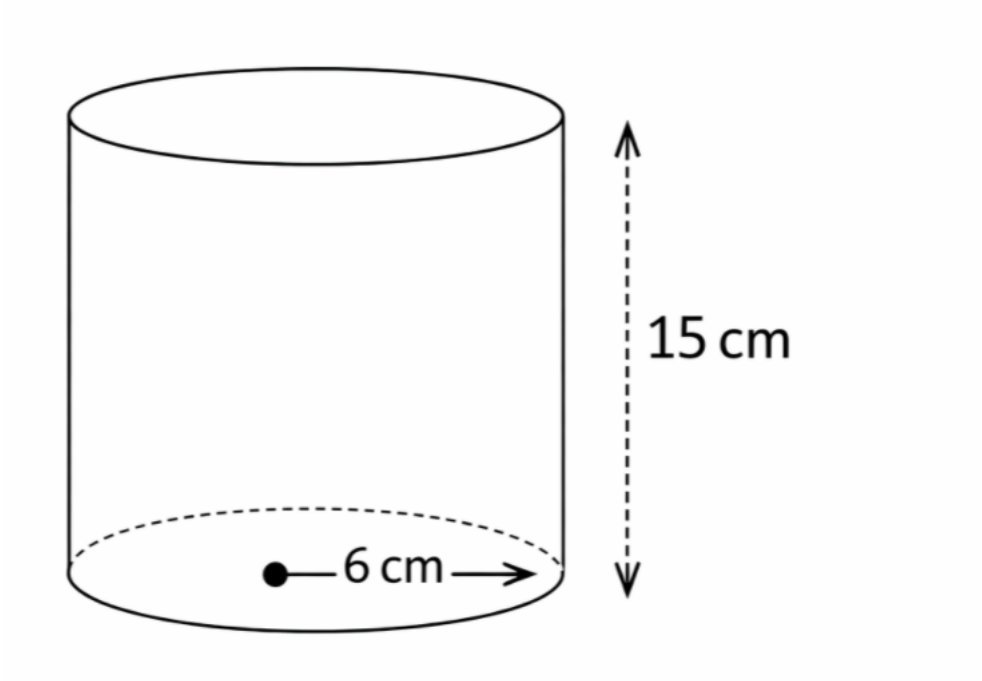
$\frac{24}{3} = 8$

.....8cm.....

(2)

(Total for Question 26 is 4 marks)

27 Shown below is a **cylinder**.



Work out the **surface area** of the **cylinder.**

Give your answer in terms of π.

$2\pi r^2 + 2\pi rh$

$2\pi \times 36 = 72\pi$

$2 \times 6 \times 15 = 180\pi$

$72\pi + 180\pi = 252\pi$

.....252π.....cm^2

(4)

(Total for Question 27 is 4 marks)

28 Tony works **37 hours** per week.

He is paid **£15 per hour**.

Work out Tony's **weekly wage**.

37 x 15

30 x 15 = 450 +
7 x 15 = 105
555

£555

(3)

(Total for Question 28 is 3 marks)

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29 Solve the **equation:** $4x - 7 = 3x + 9$

4x - 7 = 3x + 9
-3x -3x

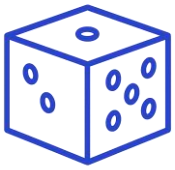
x - 7 = 9
+7 +7

x = 16

x = 16

(3)

(Total for Question 29 is 3 marks)



30 A **lucky number** is defined as a number that is **divisible** by **3** and contains the digit **7**.

Iris says: "If you pick any **two-digit** number that contains a **7**, it has a **1 in 3** chance of being lucky."

(a) List **all** the two-digit numbers that contain the digit 7.

17, 27, 37, 47, 57, 67, 77, 87, 97
70, 71, 72, 73, 74, 75, 76, 78, 79

.....

(2)

(b) From your list, **determine** how many of them are **divisible by 3**.

Is Iris **correct**?

Show your working.

27÷3=9
57÷3=19
72÷3=24
75÷3=25
78÷3=26
87÷3=29

6
18 ∴ Yes

.....

(2)

(Total for Question 30 is 4 marks)

31 At **Lucky Maths Tuition Centre**, there are **20 students** in a class.

The ratio of **boys to girls** is **3 : 2**.

(a) How many **boys** are in the class?

3+2=5
20÷5=4
4x3=12

12

(1)

(b) How many **girls** are in the class?

2x4=8

8

(1)

(c) During a homework check:

$\frac{2}{3}$ **of the boys** completed their homework.

$\frac{1}{2}$ **of the girls** completed their homework.

Using your answers from the previous question:

How many students completed their homework in total?

$\frac{2}{3}$ of 12 = 12÷3=4 4x2=8

$\frac{1}{2}$ of 8 = 8÷2=4 4x1=4

8+4=12

12

(3)

(Total for Question 31 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS