

11+ Maths Practice Paper

Year 6 · Advanced

Lesson 5.5: Simultaneous logic puzzles

Read this with your child:

1. This paper has **27 questions** in two parts. Work through them in order. The questions get harder as you go.
2. **Part 1** is multiple choice. Choose **one** answer, A, B, C, D or E, and mark it on the separate answer sheet by drawing a firm line through the box next to its letter. If you change your mind, rub the line out completely and mark your new answer.
3. **Part 2** asks you to write your answer. Write it in the boxes on the answer sheet, **one digit in each box**, starting from the left.
4. If a question is hard, leave it and come back to it at the end.
5. You may use rough paper for working out. You may **not** use a calculator.
6. Suggested time: **35 minutes**.

The answer sheet is after the questions. The answers, with a short explanation of each, are at the back for a parent to mark with.

These are original practice questions written by Elite Learners in the style of 11+ entrance tests. They are not produced by, or connected with, GL Assessment or Cambridge University Press & Assessment (CEM).

Example

a and b are two whole numbers. $a + b = 20$ and $a - b = 4$.

What is the bigger number, a ?

A 12

B 8

C 10

D 16

E 24

Answer: A Take the difference off: $20 - 4 = 16$. Share it: $b = 8$. Then $a = 8 + 4 = 12$.

The answer, A, has already been marked on your answer sheet.

Now turn over and start Part 1.

Part 1: Multiple choice

1

Each shape stands for a whole number. The same shape always stands for the same number.

What number does the triangle stand for?

$$\star + \star + \star + \star = 24$$

$$\star + \bigcirc + \bigcirc = 20$$

$$\bigcirc + \bigcirc + \triangle + \triangle = 30$$

A 8

B 7

C 6

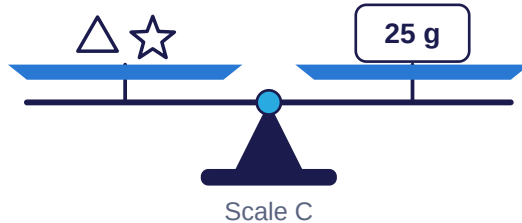
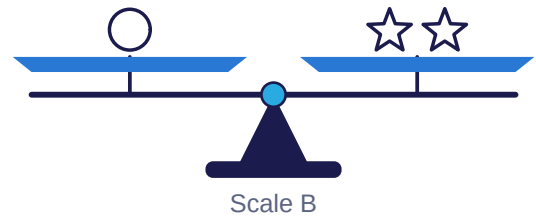
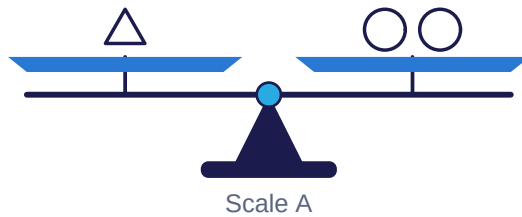
D 16

E 15

2

The scales balance. Shapes that look the same weigh the same.

How many grams does a star weigh?



A 10

B 20

C 12

D 5

E 25

3

a and b are whole numbers. $2a + b = 19$ and $a + b = 12$.

What is b ?

A 7

B 12

C 19

D 5

E 6

4

a and b are whole numbers. $a + b = 31$ and $a - b = 7$.

What is b ?

A 19

B 12

C 15

D 24

E 7

5

Each shape stands for a whole number. The same shape always stands for the same number.

What is the missing total?

$$\star + \bigcirc = 13$$

$$\bigcirc + \triangle = 15$$

$$\star + \triangle = 12$$

$$\star + \bigcirc + \triangle = \boxed{?}$$

A 20

B 40

C 27

D 25

E 13

6

In this grid, each shape stands for a whole number. The number at the end of each row is its total, and the number under each column is its total.

What is the missing total?

$\star$	$\bigcirc$	$\star$	19
$\bigcirc$	$\bigcirc$	$\bigcirc$	21
$\triangle$	$\star$	$\triangle$	22
21	$\boxed{?}$	21	

A 21

B 18

C 20

D 22

E 26

7

Each shape stands for a whole number. The same shape always stands for the same number.

What number does the square stand for?

$$\square + \square + \triangle = 25$$

$$\square + \triangle + \triangle = 23$$

A 7

B 12

C 16

D 9

E 8

8

4 pens and a ruler cost £14, and 2 pens and a ruler cost £8. Every pen costs the same.

How many pounds does the ruler cost?

A 3

B 6

C 2

D 8

E 4

9

A box holds beetles and spiders. A beetle has 6 legs and a spider has 8 legs. There are 7 creatures with 50 legs altogether.

How many spiders are there?

A 4

B 3

C 5

D 6

E 7

10

Raj is 5 times as old as his son. Their ages add up to 42.

How old is Raj?

A 7

B 30

C 35

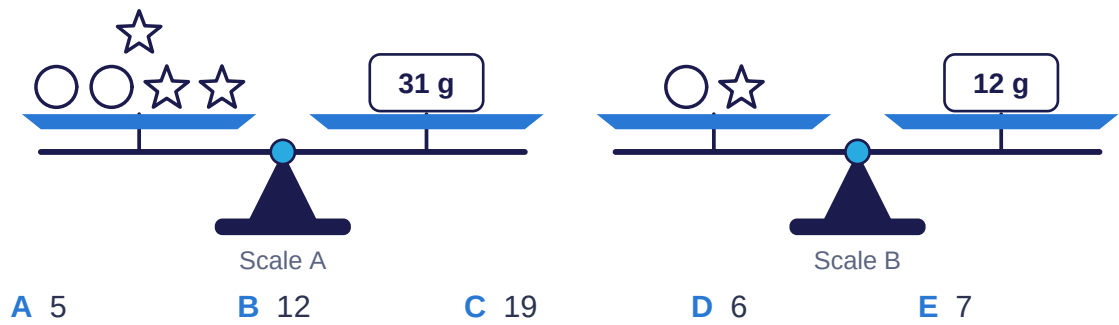
D 37

E 40

11

The scales balance. Shapes that look the same weigh the same.

How many grams does a star weigh?



12

Mia buys 2 cakes and a drink for £7. Leo buys 1 cake and a drink for £5. A cake costs £ c and a drink costs £ d .

Which pair of clues is right?

- A $2c + d = 5$ and $c + d = 7$
- B $c + 2d = 7$ and $c + d = 5$
- C $2c + 2d = 7$ and $c + d = 5$
- D $2c + d = 7$ and $c + d = 7$
- E $2c + d = 7$ and $c + d = 5$

13

The total of two numbers is 85. Their difference is 27.

What is the bigger number?

- A 29 B 58 C 42 D 56 E 112

14

a and b are whole numbers. $a + a + b = 22$ and $a + b + b = 20$.

What is a ?

- A 6 B 8 C 14 D 11 E 10

15

In this grid, each shape stands for a whole number. The number at the end of each row is its total, and the number under each column is its total.

What number does the square stand for?

			21
			20
			17
20	18	20	

A 9

B 7

C 4

D 20

E 11

16

A farm has hens and sheep. A hen has 2 legs and a sheep has 4 legs. There are 20 heads and 56 legs.

How many sheep are there?

A 12

B 14

C 10

D 16

E 8

17

One number is 6 more than another. Three times the smaller number is 27.

What is the bigger number?

A 9

B 15

C 33

D 21

E 81

18

Each shape stands for a whole number. The same shape always stands for the same number.

What number does the circle stand for?

$$\bigcirc + \star + \star = 20$$

$$\bigcirc = \star + 8$$

A 4

B 8

C 12

D 20

E 6

19

 $a + b = 17$ and $a - b = 5$.**Which values fit both clues?****A** $a = 12, b = 5$ **B** $a = 10, b = 7$ **C** $a = 6, b = 11$ **D** $a = 11, b = 7$ **E** $a = 11, b = 6$

20

 a and b are whole numbers. $3a + b = 26$ and $a + b = 12$.**What is a ?****A** 14**B** 7**C** 5**D** 12**E** 6**Part 2: Write your answer**

21

Each shape stands for a whole number. The same shape always stands for the same number.

What number does the star stand for?

$$\text{hexagon} + \text{hexagon} + \text{hexagon} = 39$$

$$\text{hexagon} + \text{star} + \text{star} = 25$$

Write your answer in the boxes on the answer sheet, one digit in each box.

22

 a and b are whole numbers. $a + b = 48$ and $a - b = 12$.**What is a ?***Write your answer in the boxes on the answer sheet, one digit in each box.*

23

The scales balance. Shapes that look the same weigh the same.

How many grams does the square weigh?



Write your answer in the boxes on the answer sheet, one digit in each box.

24

In this grid, each shape stands for a whole number. The number at the end of each row is its total, and the number under each column is its total.

What is the missing total?

△	△	△	27
○	○	☆	21
☆	△	○	?
22	26	22	

Write your answer in the boxes on the answer sheet, one digit in each box.

25

A farm has hens and sheep. A hen has 2 legs and a sheep has 4 legs. There are 25 heads and 74 legs.

How many sheep are there?

Write your answer in the boxes on the answer sheet, one digit in each box.

26

Two numbers add up to 96. One number is 5 times the other.

What is the bigger number?

Write your answer in the boxes on the answer sheet, one digit in each box.

Each shape stands for a whole number. The same shape always stands for the same number.

What number does the triangle stand for?

$$\triangle + \square = 21$$

$$\square + \diamond = 25$$

$$\triangle + \diamond = 18$$

Write your answer in the boxes on the answer sheet, one digit in each box.

Answer sheet

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Name

Draw a firm line through the box next to your answer, like the example.

Part 1: Multiple choice

Ex	A	☒	B	☐	C	☐	D	☐	E	☐
1	A	☐	B	☐	C	☐	D	☐	E	☐
2	A	☐	B	☐	C	☐	D	☐	E	☐
3	A	☐	B	☐	C	☐	D	☐	E	☐
4	A	☐	B	☐	C	☐	D	☐	E	☐
5	A	☐	B	☐	C	☐	D	☐	E	☐
6	A	☐	B	☐	C	☐	D	☐	E	☐
7	A	☐	B	☐	C	☐	D	☐	E	☐
8	A	☐	B	☐	C	☐	D	☐	E	☐
9	A	☐	B	☐	C	☐	D	☐	E	☐
10	A	☐	B	☐	C	☐	D	☐	E	☐
11	A	☐	B	☐	C	☐	D	☐	E	☐
12	A	☐	B	☐	C	☐	D	☐	E	☐
13	A	☐	B	☐	C	☐	D	☐	E	☐
14	A	☐	B	☐	C	☐	D	☐	E	☐
15	A	☐	B	☐	C	☐	D	☐	E	☐
16	A	☐	B	☐	C	☐	D	☐	E	☐
17	A	☐	B	☐	C	☐	D	☐	E	☐
18	A	☐	B	☐	C	☐	D	☐	E	☐
19	A	☐	B	☐	C	☐	D	☐	E	☐
20	A	☐	B	☐	C	☐	D	☐	E	☐

Part 2: Write your answer, one digit in each box

21		
22		
23		
24		
25		
26		
27		

Answers

For a parent to mark with. One mark for each question: the paper is out of 27. Talk through any your child got wrong, using the explanation.

Q	Answer	How to get it
1	A 8	Four stars make 24, so a star is 6. Then $6 + \text{two circles} = 20$, so a circle is 7. Then $14 + \text{two triangles} = 30$, so two triangles make 16 and a triangle is 8.
2	D 5	Swap the triangle for two circles, then each circle for two stars: the triangle is four stars. So scale C has five stars weighing 25 g, and a star weighs 5 g.
3	D 5	The first clue has one extra a : $a = 19 - 12 = 7$. Then $b = 12 - 7 = 5$.
4	B 12	Take the difference off: $31 - 7 = 24$. Share it: $b = 12$. Then $a = 12 + 7 = 19$.
5	A 20	Add all three clues: $13 + 15 + 12 = 40$. That has every shape twice, so one of each makes half of 40, which is 20.
6	C 20	Row 2 is 3 circles making 21, so a circle is 7. Row 1 makes 19; take away the shapes you know: $19 - 7 = 12$, which is 2 stars, so a star is 6. Column 1 makes 21; take away the shapes you know: $21 - 13 = 8$, so the triangle is 8. The missing total is column 2: $7 + 7 + 6 = 20$.
7	D 9	Add the two clues: three squares and three triangles make 48, so one square and one triangle make 16. Take that from the first clue: the square is $25 - 16 = 9$.
8	C 2	The first has two extra pens and costs $14 - 8 = £6$ more, so two pens cost £6 and a pen costs £3. Then $8 - 6 = 2$, so the ruler costs £2.
9	A 4	All beetles would be 42 legs, 8 too few. Each spider adds 2 legs: $8 \div 2 = 4$ spiders (and 3 beetles).
10	C 35	That is 6 equal parts: $42 \div 6 = 7$, the son's age. Raj is $5 \times 7 = 35$.
11	E 7	Two of scale B make two circles and two stars, 24 g. Scale A has one more star than that and weighs $31 - 24 = 7$ g more, so a star weighs 7 g (and a circle 5 g).
12	E $2c + d = 7$ and $c + d = 5$	Mia's 2 cakes and a drink make $2c + d = 7$, and Leo's cake and drink make $c + d = 5$. (Then $c = 2$ and $d = 3$.)
13	D 56	Take the difference off: $85 - 27 = 58$. Share it: 29, the smaller number. The bigger number is $29 + 27 = 56$.
14	B 8	Add the two clues: three a and three b make 42, so $a + b = 14$. Then the first clue is $a + 14 = 22$, so $a = 8$ (and $b = 6$).
15	A 9	Row 1 is 3 diamonds making 21, so a diamond is 7. Column 2 makes 18; take away the shapes you know: $18 - 14 = 4$, so the star is 4. Column 1 makes 20; take away the shapes you know: $20 - 11 = 9$, so the square is 9.
16	E 8	All hens would be 40 legs, 16 too few. Each sheep adds 2 legs: $16 \div 2 = 8$ sheep (and 12 hens).
17	B 15	Three times the smaller number is 27, so the smaller number is $27 \div 3 = 9$. The bigger number is $9 + 6 = 15$.

Q	Answer	How to get it
18	C 12	The second clue says a circle is a star and 8 more. Swap it in the first clue: three stars and 8 make 20, so three stars make 12 and a star is 4. The circle is $4 + 8 = 12$.
19	E $a = 11, b = 6$	Take the difference off: $17 - 5 = 12$, so $b = 6$ and $a = 11$. Check: $11 + 6 = 17$ and $11 - 6 = 5$. Each other pair fails one clue.
20	B 7	The first clue has two extra a , and it is $26 - 12 = 14$ more. So two a make 14 and $a = 7$ (and $b = 5$).
21	6	Three hexagons make 39, so a hexagon is 13. Then $13 + \text{two stars} = 25$, so two stars make 12 and a star is 6.
22	30	Take the difference off: $48 - 12 = 36$. Share it: $b = 18$. Then $a = 18 + 12 = 30$.
23	16	Scale A has one extra circle and weighs $34 - 25 = 9$ g more, so a circle weighs 9 g. On scale B, square + 9 = 25, so the square weighs 16 g.
24	22	Row 1 is 3 triangles making 27, so a triangle is 9. Column 2 makes 26; take away the shapes you know: $26 - 18 = 8$, so the circle is 8. Column 1 makes 22; take away the shapes you know: $22 - 17 = 5$, so the star is 5. The missing total is row 3: $5 + 9 + 8 = 22$.
25	12	All hens would be 50 legs, 24 too few. Each sheep adds 2 legs: $24 \div 2 = 12$ sheep (and 13 hens).
26	80	That is 6 equal parts: $96 \div 6 = 16$, the smaller number. The bigger number is $5 \times 16 = 80$.
27	7	Add all three clues: $21 + 25 + 18 = 64$, every shape twice. So one of each makes 32. The square and diamond make 25, so the triangle is $32 - 25 = 7$.

Score: out of 27