

Linear equations

Exam questions

Foundation and Higher tiers

Please write clearly in block capitals.

Name

Class

Teacher

Time allowed: 100 minutes

Materials

For this booklet you need a black pen, a pencil, a ruler, a rubber and a calculator for Section B.

Instructions

- Use black ink or black ballpoint pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions in the spaces provided.
- **Section A** (questions 1 to 13): you must not use a calculator.
- **Section B** (questions 14 to 26): you may use a calculator.
- Do all rough work in this booklet. Cross through any work you do not want marked.

Information

- The marks for each question are shown in brackets.
- The maximum mark for this booklet is 87.

Advice

- Read each question carefully.
- In all calculations, show clearly how you work out your answer.

For teacher’s use

Q	Mark	Q	Mark
1		14	
2		15	
3		16	
4		17	
5		18	
6		19	
7		20	
8		21	
9		22	
10		23	
11		24	
12		25	
13		26	
TOTAL			

Section A**You must not use a calculator**Do not
write
outside
the box

- 1** **(a)** Solve $7w = 56$

$w =$ _____ **[1 mark]**

- (b)** Solve $\frac{k}{3} = 12$

$k =$ _____ **[1 mark]**

- 2** Nia thinks of a number.
She multiplies the number by 3, adds 8 and then halves the result.
Her answer is 22

Work out the number Nia thought of.

Answer _____ **[2 marks]**

3 **(a)** Solve $5x - 8 = 27$

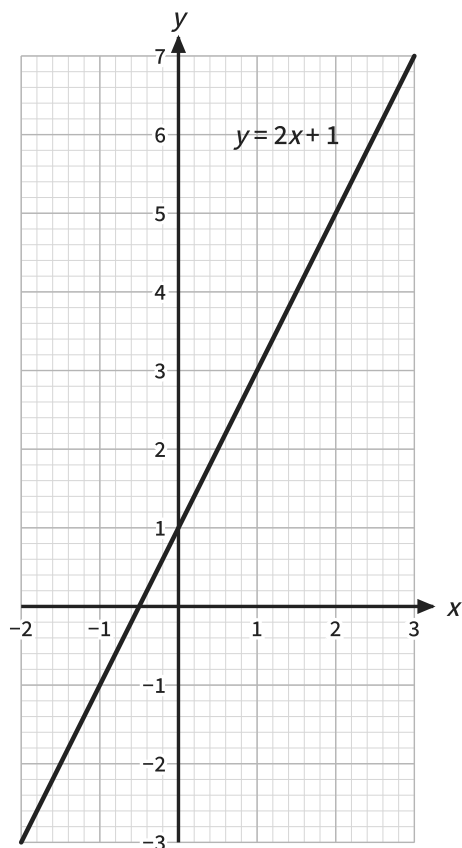
$x =$ _____ **[2 marks]**

(b) Solve $18 - 3p = 6$

$p =$ _____ **[2 marks]**

- 4 Here is the graph of $y = 2x + 1$ for values of x from -2 to 3

Do not
write
outside
the box



- (a) Use the graph to solve $2x + 1 = 6$

$x =$ _____

[1 mark]

- (b) Use the graph to solve $2x + 1 = -2$

$x =$ _____

[1 mark]

5 Ellis solves $7a - 5 = 3a + 11$

Here is his working.

$$7a - 5 = 3a + 11$$

$$7a - 3a = 11 - 5$$

$$4a = 6$$

$$a = 1.5$$

(a) Describe the mistake Ellis makes.

[1 mark]

(b) Work out the correct solution.

$$a = \underline{\hspace{10cm}}$$

[2 marks]

6 Solve $3(2y - 5) = 2y + 7$

$$y = \underline{\hspace{10cm}}$$

[3 marks]

7 **(a)** Solve $\frac{2x+3}{5} = 7$

Do not
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the box

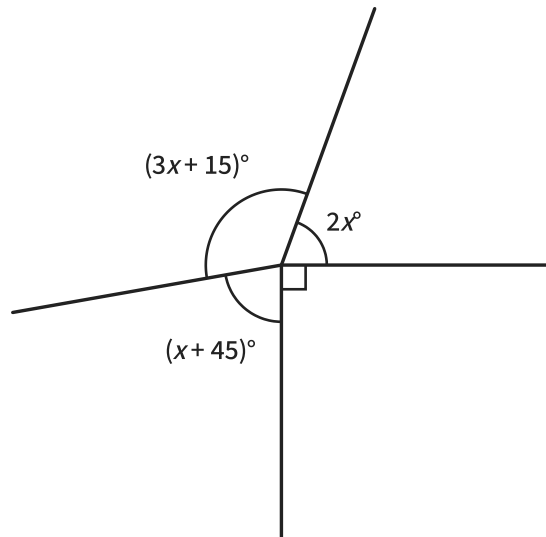
$x =$ _____ **[2 marks]**

(b) Solve $\frac{x}{4} + 6 = 2$

$x =$ _____ **[2 marks]**

- 8 Four angles meet at a point.

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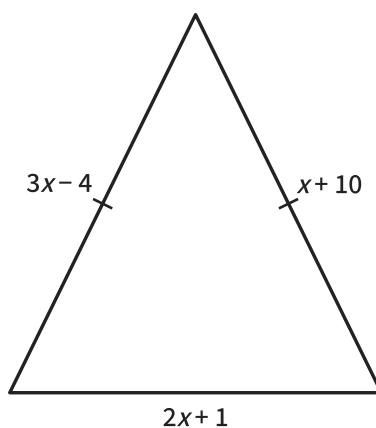


Not drawn accurately

Work out the size of the largest angle.

Answer _____ degrees
[4 marks]

- 9** The diagram shows an isosceles triangle.
All lengths are in centimetres.



Not drawn accurately

Work out the perimeter of the triangle.

Answer _____ cm

[4 marks]

- 10** Solve $5 - 2(3c - 4) = c - 1$

$c =$ _____

[3 marks]

Do not
write
outside
the box

- 11** Priya, Tom and Sita share the cost of a present.
Priya pays £ x .
Tom pays £4 more than Priya.
Sita pays twice as much as Tom.
The present costs £64
- How much does Sita pay?

Answer £ _____

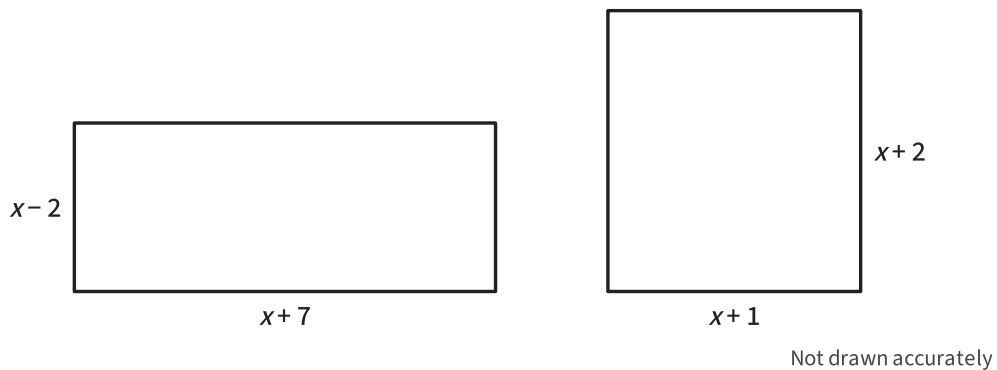
[4 marks]

- 12** Solve $\frac{3x-2}{4} - \frac{x+1}{3} = 1$

$x =$ _____

[3 marks]

- 13** The two rectangles have the same area.
All lengths are in centimetres.



Work out the value of x .

$x =$ _____

[4 marks]

Do not
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outside
the box

Section B



You may use a calculator

Do not
write
outside
the box

- 14** (a) Solve $2.4x + 7.3 = 19.9$

$x =$ _____ [2 marks]

- (b) Solve $\frac{m}{1.6} = 4.35$

$m =$ _____ [1 mark]

- 15** An electrician uses this formula to work out the charge for a job.

$$C = 42.5h + 38$$

C is the charge in pounds.

h is the number of hours the job takes.

The charge for one job is £216.50

How long did the job take?

Give your answer in hours and minutes.

Answer _____ [3 marks]

16 (a) Solve $3.6(x - 2.15) = 9.18$

$x =$ _____
[2 marks]

(b) Solve $\frac{y + 4.8}{2.5} = 3.14$

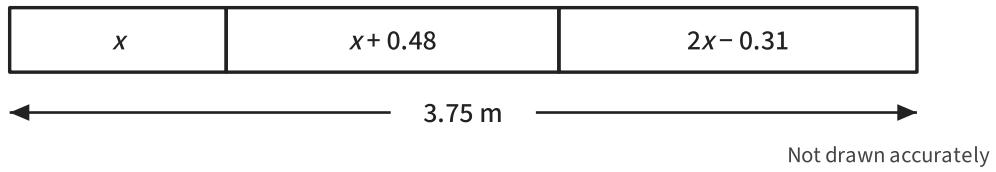
$y =$ _____
[2 marks]

- 17** Tariq buys some notebooks and 4 pencil cases.
Each notebook costs £1.38
Each pencil case costs £2.65
He pays with a £20 note and gets £1.12 change.

Form and solve an equation to work out how many notebooks Tariq buys.

Answer _____
[3 marks]

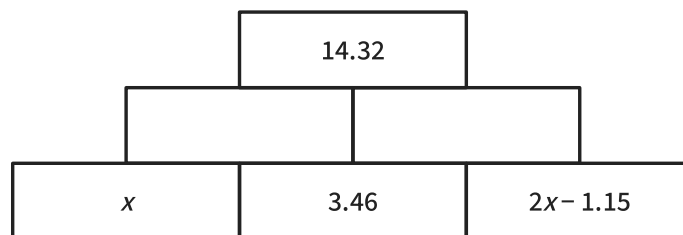
- 18** Ines cuts a 3.75 m length of fabric into three pieces.
The diagram shows the length of each piece in metres.



Work out the length of the longest piece.
Give your answer in centimetres.

Answer _____ cm
[4 marks]

- 19** In this number wall, each brick is the sum of the two bricks directly below it.



Work out the value of x .

$x =$ _____
[3 marks]

20

A box contains 24 identical tins of tomatoes.
The total mass of the box and the tins is 11.85 kg.
The empty box has a mass of 0.33 kg.

Form and solve an equation to work out the mass of one tin.
Give your answer in grams.

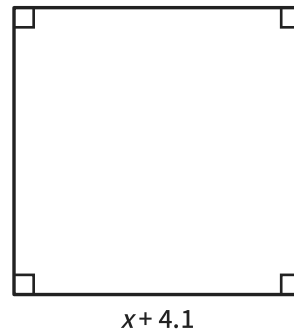
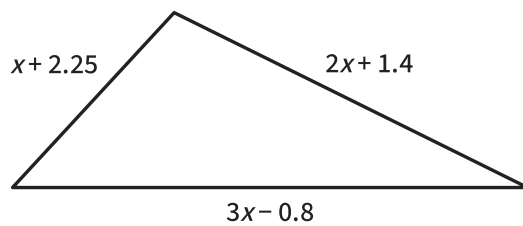
Do not
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the box

Answer _____ g

[3 marks]

- 21** The triangle and the square have the same perimeter.
All lengths are in centimetres.

Do not
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outside
the box



Not drawn accurately

Work out the area of the square.
Give your answer to 1 decimal place.

Answer _____ cm^2

[5 marks]

22 Here are four numbers.

$$x \quad 2x + 1.7 \quad 3x - 0.6 \quad 8.25$$

The mean of the four numbers is 7.9

Work out the value of x .

Give your answer to 2 decimal places.

$$x = \underline{\hspace{10cm}}$$

[3 marks]

23 Hassan solves $\frac{5x + 2.3}{4} = 1.7x - 0.62$

He says, "The solution is $x = 2.6$ to 1 decimal place."

Is Hassan correct?

You must show your working.

[3 marks]

24

Solve $\frac{9.12}{2x - 1.3} = 3.8$

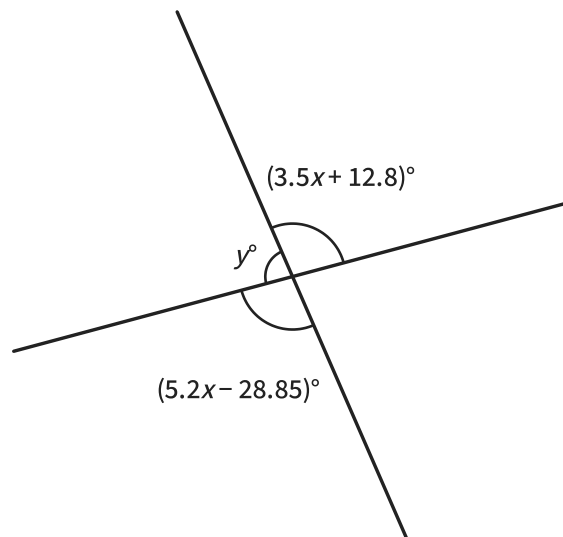
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$x =$ _____

[3 marks]

25

Two straight lines cross.



Not drawn accurately

Work out the value of y .

$y =$ _____

[4 marks]

26

Mia and Kofi leave their phones switched on but not in use.

Mia's phone shows 80% battery. It loses 1.5% of its battery every hour.

Kofi's phone shows 72% battery. It loses 0.9% of its battery every hour.

After how long will the two phones show the same battery percentage?

Give your answer in hours and minutes.

Answer _____

[4 marks]

END OF QUESTIONS