JustMaths

Forming & Solving Equations (H & F)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

Name:	Lisa Woods
Total Marks:	

1. The diagram shows a square.
All the lengths are measured in centimetres.
Diagram not drawn to scale
Use an algebraic method to find the length of one side of the square.

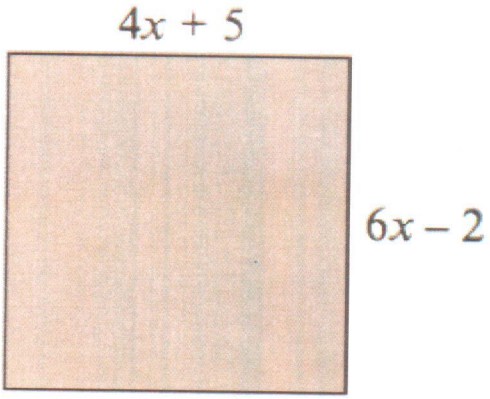


Diagram not drawn to scale

$4x + 5 = 6x - 2$

$5 = 2x - 2$

$7 = 2x$

$x = 3.5$

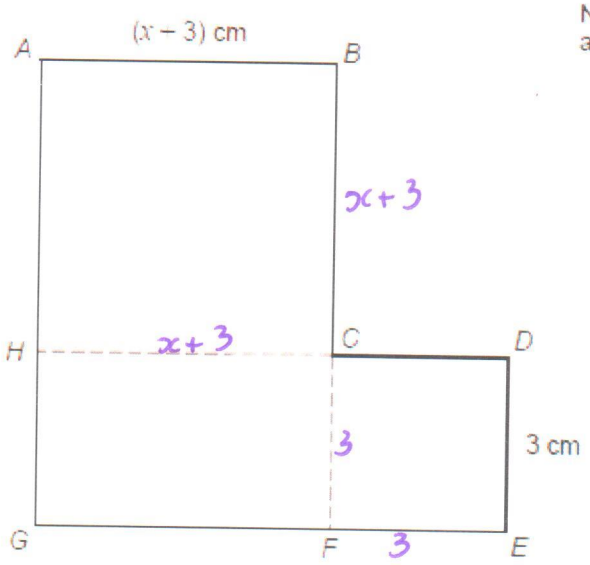
$4 \times 3.5 + 5 = 19$cm

[5]

2. ABCH is a square.
HCFG is a rectangle.
CDEF is a square.

They are joined to make an L-shape.
Show that the total area of the L-shape, in cm^2, is $x^2 + 9x + 27$

Not drawn accurately



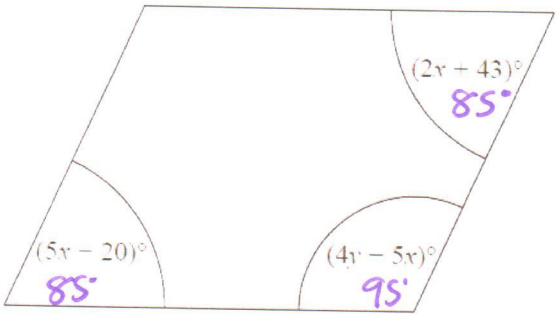
$(x+3)^2 + 3(x+3) + 3^2$

$x^2 + 6x + 9 + 3x + 9 + 9$

$= x^2 + 9x + 27$

[4]

3. Here is a parallelogram.



360 − 85 − 85
= 190
190/2 = 95

Work out the value of x and the value of y.

5x − 20 = 2x + 43
3x = 63
x = 21

5x − 20
∴ = 85°

4y − 5x = 95
4y − 5x21 = 95
4y − 105 = 95
4y = 200
y = 50°

x = 21°

y = 50°

[5]

4. Kieran, Jermaine and Chris play football.

- Kieran has scored 8 more goals than Chris.
- Jermaine has scored 5 more goals than Kieran.
- Altogether they have scored 72 goals.

How many goals did they each score?

K = C + 8 ∴ C = K − 8
J = K + 5

K + J + C = 72
K + K + 5 + K − 8 = 72
3K = 75
K = 25

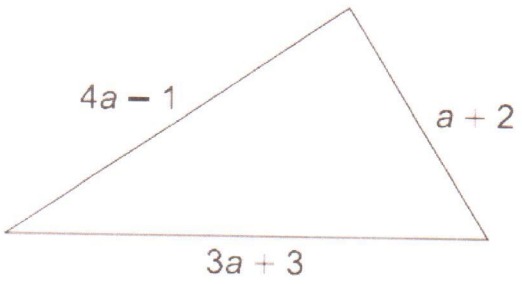
Kieran 25

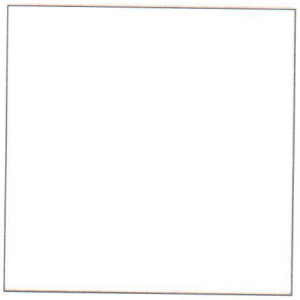
Jermaine 30

Chris 17

[5]

5. The perimeter of the triangle is the same length as the perimeter of the square.





Find an expression for the length of one side of the square in terms of a.

Give your answer in its simplest form.

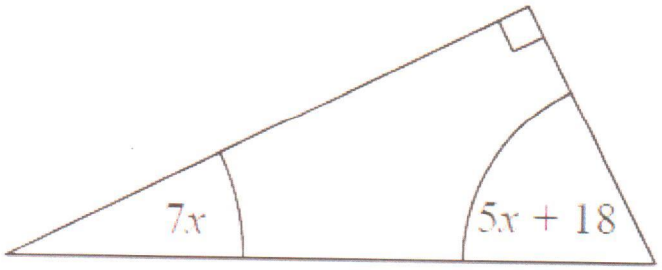
$4a - 1 + a + 2 + 3a + 3$

$8a + 4$

$\div 4 \quad \frac{8a+4}{4} = 2a + 1$

.....2a + 1..... [4]

6. The diagram shows a right-angled triangle.



All the angles are in degrees.

Work out the size of the smallest angle of the triangle.

$7x + 5x + 18 = 90$

$12x = 72$

$x = 6$

$7 \times 6 = 42$

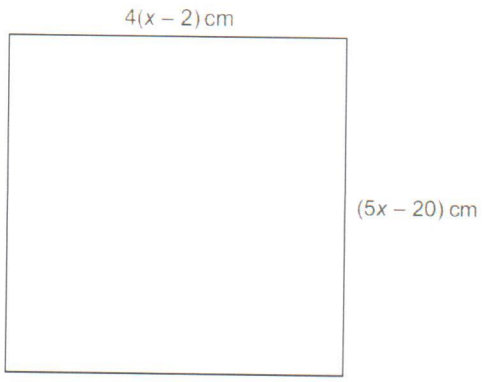
$5 \times 6 + 18 = 48$

$\therefore$ smallest angle is $42°$

[3]

7. This is a square.

Not to scale



Work out the length of the side of the square.

$4x - 8 = 5x - 20$

$-8 = x - 20$

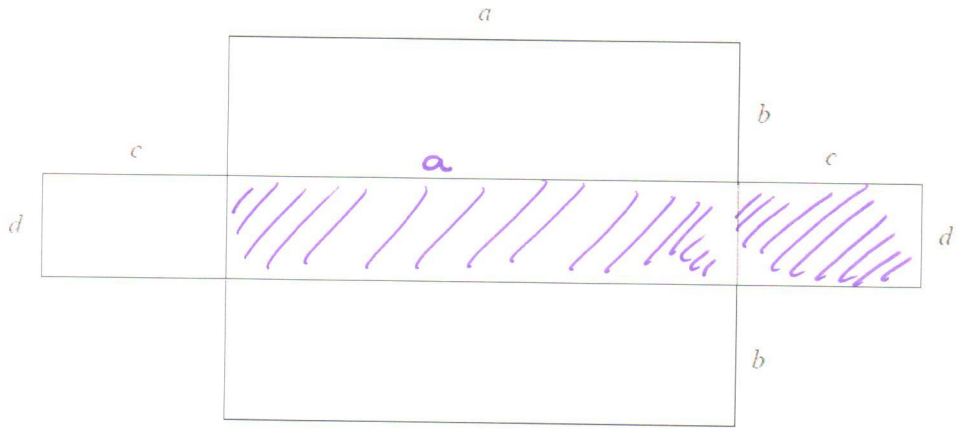
$x = 12$

$4 \times 10 = 40$

40 cm [5]

8. A shape is made from rectangles.

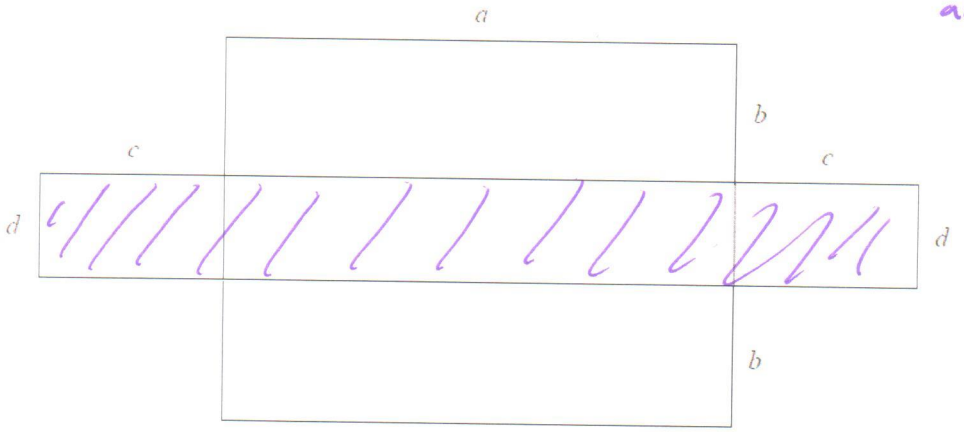
a) On the diagram below shade an area represented by the expression ad + cd



[1]

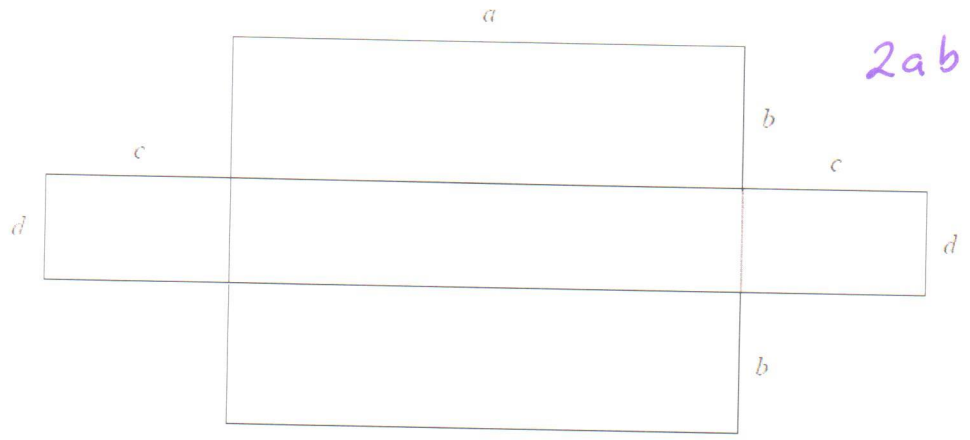
b) On the diagram below shade the area represented by the expression d(a + 2c)

ad + 2cd



[1]

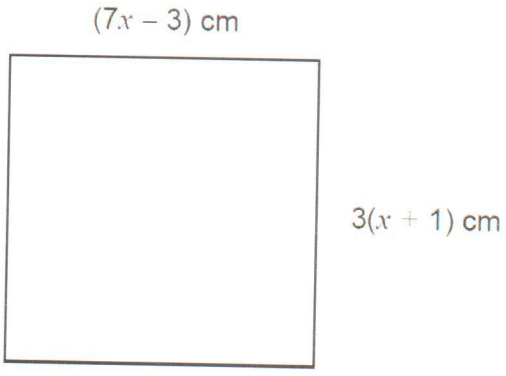
c) Write down an expression for the area of the whole shape.



$2ab + d(a+2c)$

[1]

9 The diagram shows a square.



Work out the length of one side of the square.

$7x - 3 = 3(x+1)$

$7x - 3 = 3x + 3$

$4x = 6$

$x = 3/2$

$7x - 3$

$7(3/2) - 3 = 7.5\text{cm}$

[4]