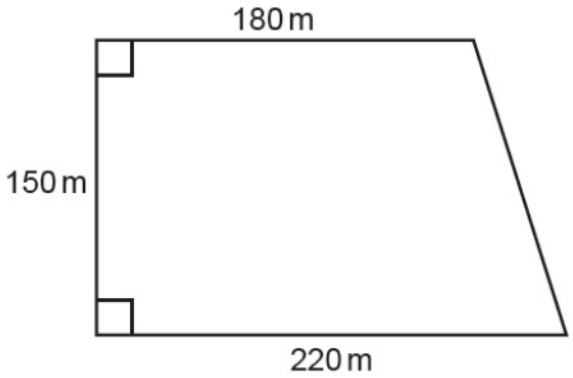
G19 Area- Trapezium

OCR

12 A farmer has a field that is in the shape of a trapezium.
He measures the field so that he can work out the area.
He puts his measurements on this diagram of the field.

Video created by W Neill



(a) The farmer has rounded his measurements to two significant figures.

Give a reason why he may have done this.

.....

(b) The field produces 6400 kilograms of wheat per hectare.
One hectare is 10 000 m^2.

Work out how many kilograms of wheat the field produces.

(b) ..... kg **[5]**

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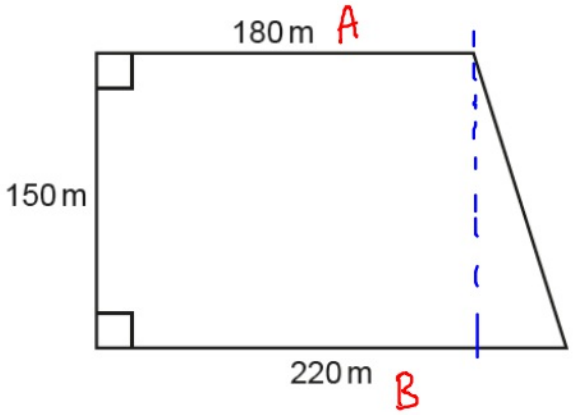


(a) The farmer has rounded his measurements to two significant figures.

Give a reason why he may have done this.

Make his calculations easier.

(b) The field produces 6400 kilograms of wheat per hectare.
One hectare is $10000\,m^2$.

Work out how many kilograms of wheat the field produces.

Area of trapezium $\frac{1}{2}(A+B)h$

$\frac{1}{2}(400)150$

$200 \times 150 = 30000\,m^2$

$10000 \xrightarrow{\times 3}$

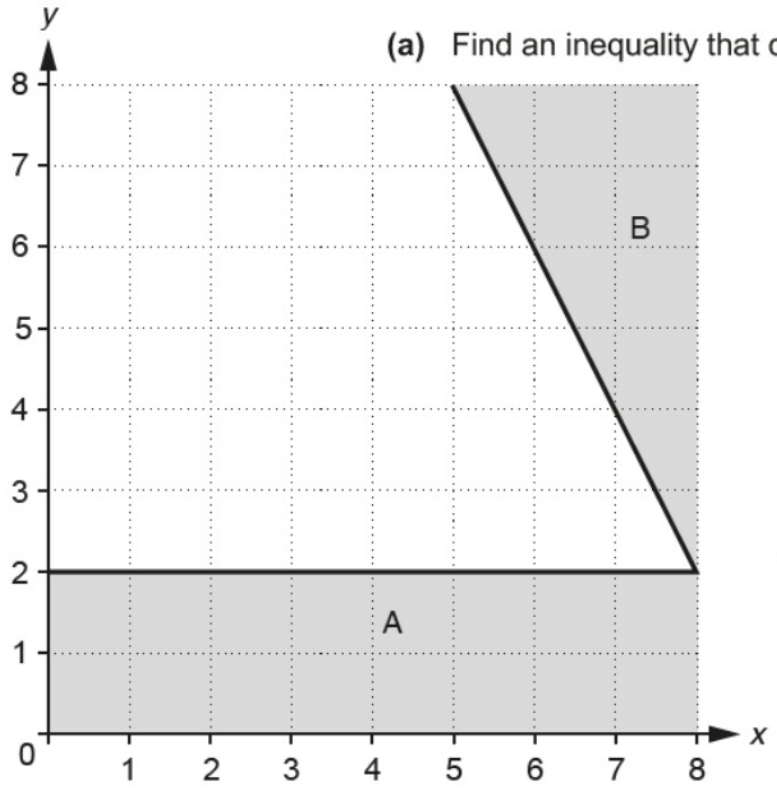
$6400\,kg \times 3 =$

$64 \times 3 = 192$

19200

(b) ..... kg **[5]**

18 The diagram below shows a 1 cm coordinate grid.



(a) Find an inequality that defines region A and another inequality that defines region B.

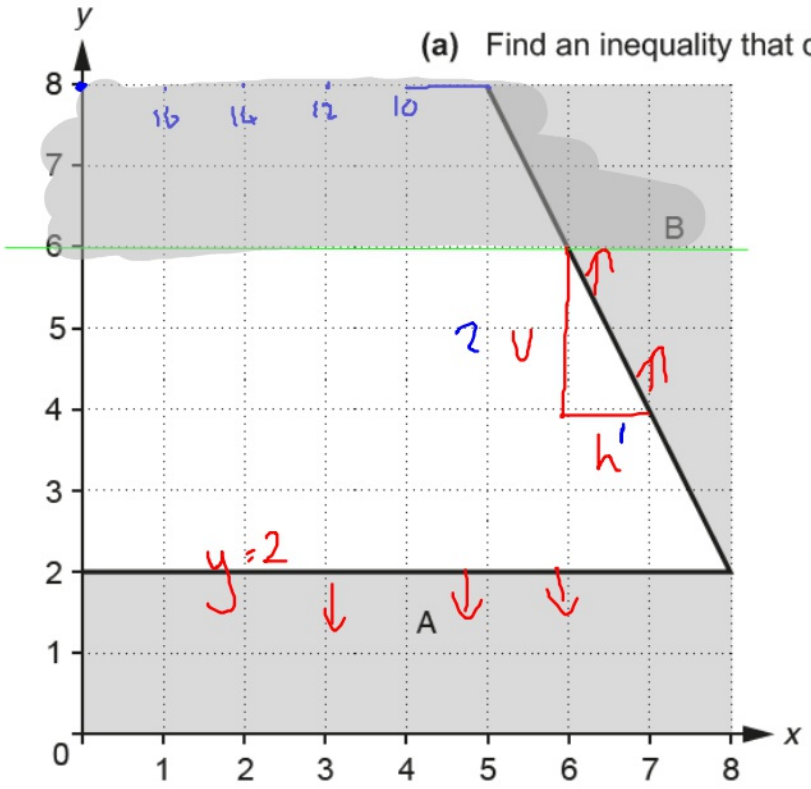
(a) Region A: .....

A62 Region B: ..... **[4]**

(b) Shade the region on the grid given by the inequality $y \geqslant 6$. **[2]**

A62

18 The diagram below shows a 1 cm coordinate grid.



(a) Find an inequality that defines region A and another inequality that defines region B.

$-\frac{V}{h} = -\frac{2}{1} = -2$

(a) Region A: $y \leq 2$

A62 Region B: $y \geq -2x + 18$ **[4]**

$y = mx + c$

$y \geq -2x + 18$

(b) Shade the region on the grid given by the inequality $y \geqslant 6$. **[2]**

A62

A23
G19
A62

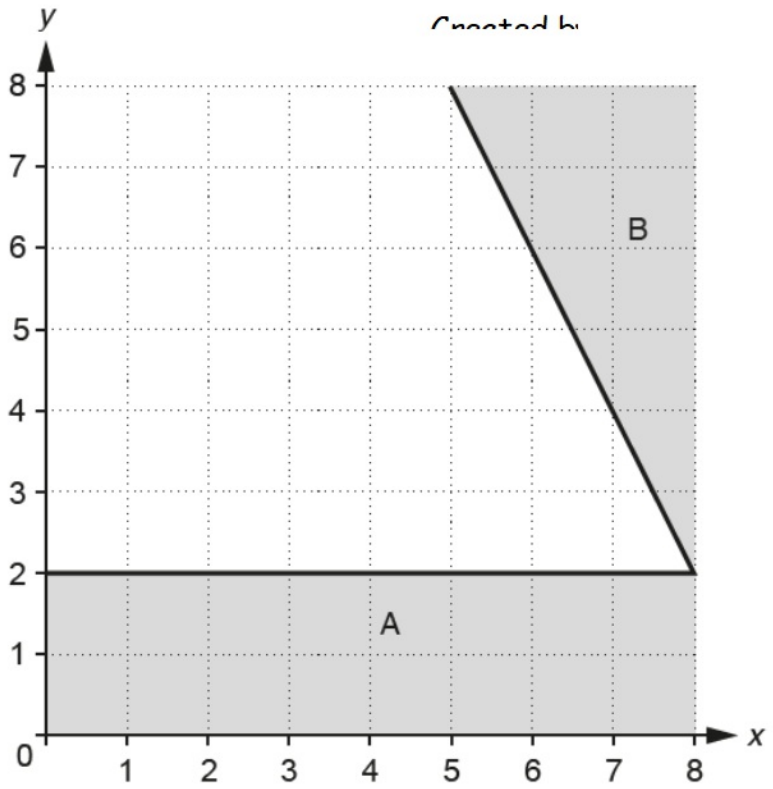
(c) A fourth shaded region, given by the inequality

$$y \geqslant kx + 2,$$

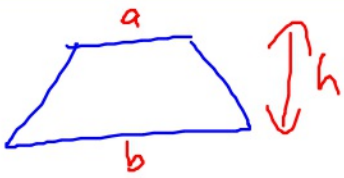
is added to the grid.

The **unshaded** region now has area 23 cm².

Find the value of k.



(c) k = ... **[5]**



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A23
G19
A62

is added to the grid.

The **unshaded** region now has area 23 cm².

Find the value of k.

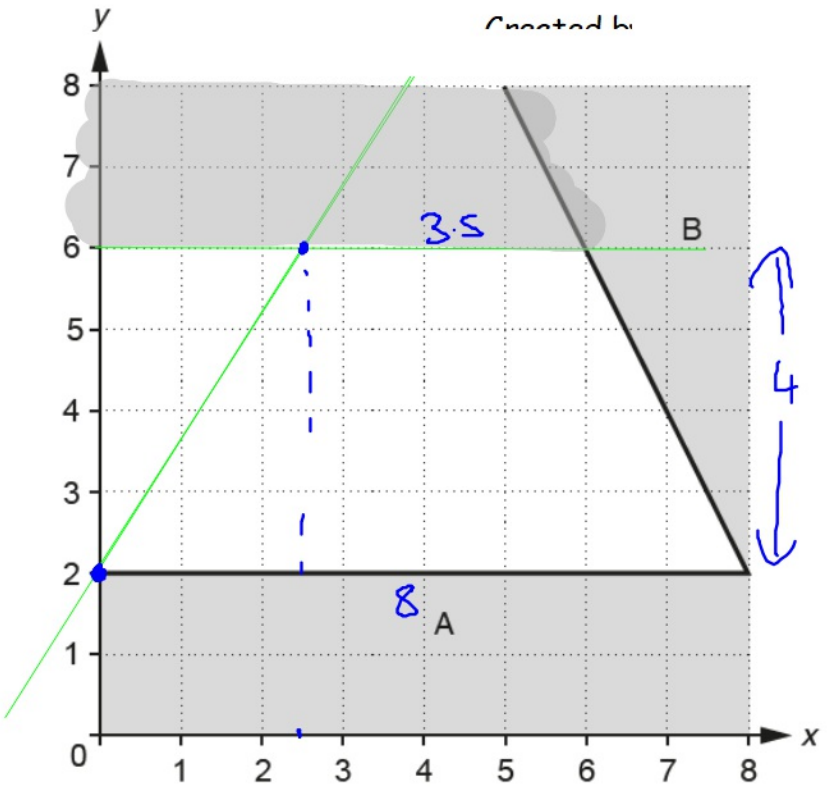
$\frac{1}{2}(a+b)h = 23$

$\frac{1}{2}(a+8)4 = 23$

$2(a+8) = 23$

$a+8 = 11.5$

$a = 3.5$

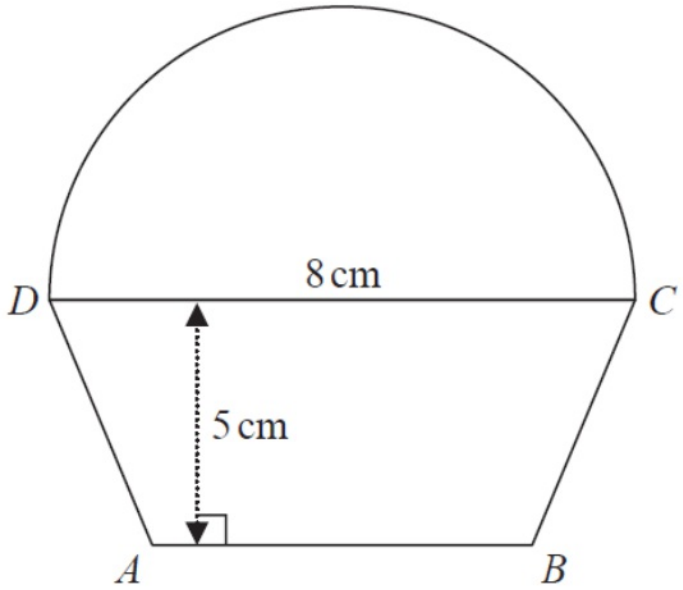


$K = \frac{V}{h} = \frac{4}{2.5} = \frac{8}{5} = 1\frac{3}{5}$

(c) $k =$ $\frac{8}{5}$ ✓ **[5]**

Edexcel

24 The diagram shows a shape made from a trapezium $ABCD$ and a semicircle with diameter DC.



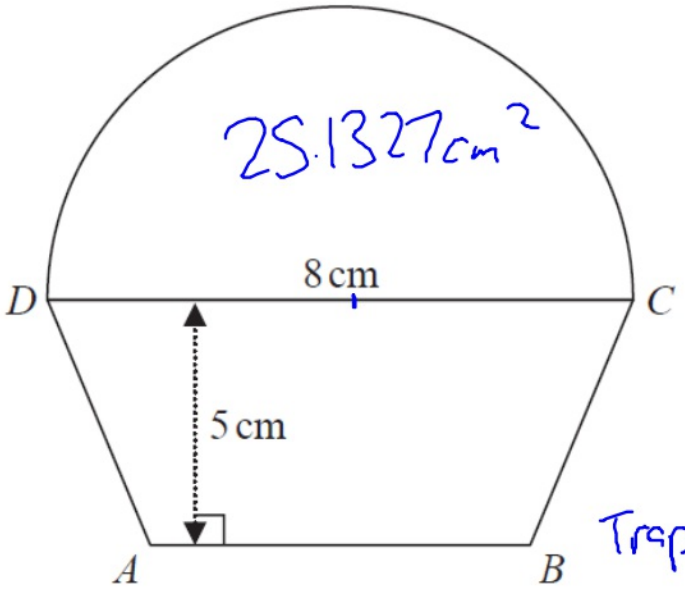
$DC = 8$ cm
The shape has area 64 cm^2
The height of the trapezium is 5 cm.

Work out the length of AB.
Give your answer correct to 1 decimal place.

..... cm

(Total for Question 24 is 5 marks)

24 The diagram shows a shape made from a trapezium $ABCD$ and a semicircle with diameter DC.

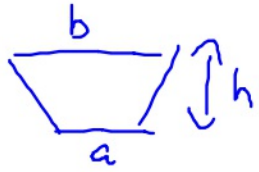


Semi-circle ... $\frac{R^2 \times \pi}{2} = \frac{4^2 \times \pi}{2} = 8\pi$

25.1327cm^2

Trapezium Area $= 64 - 25.132...$

$= 38.867\text{cm}^2$

Trapez 

$\frac{1}{2}(a+b)h = 38.867$

$\frac{1}{2}(a+8)5 = 38.867$

$a \rightarrow (+8) \rightarrow (\times 5) \rightarrow (\times \frac{1}{2}) \rightarrow 38.867$

$38.867 \rightarrow (\div \frac{1}{2}) \rightarrow (\div 5) \rightarrow (-8) \rightarrow 7.54$

$DC = 8\text{ cm}$
The shape has area 64 cm^2
The height of the trapezium is 5 cm.

Work out the length of AB.
Give your answer correct to 1 decimal place.

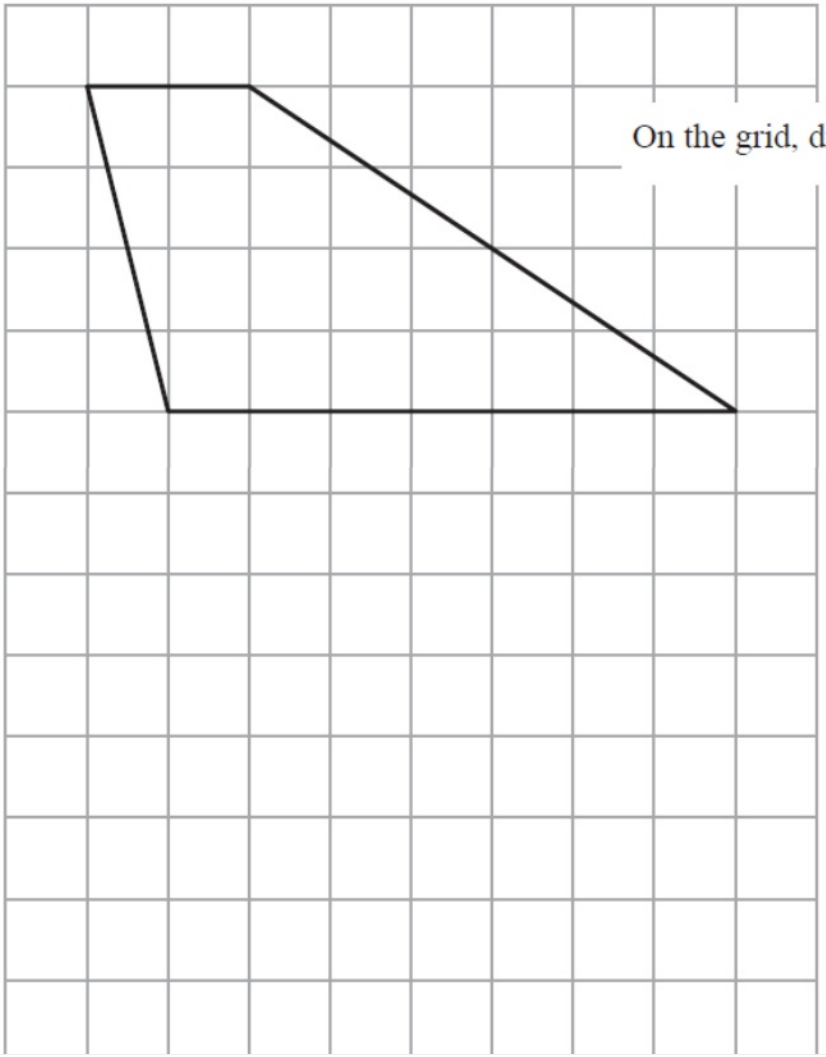
7.5 cm ✓

..... cm

Video created by W Neill

21 Here is a trapezium drawn on a centimetre grid.

G18
G19



On the grid, draw a triangle equal in area to this trapezium.

(Total for Question 21 is 2 marks)

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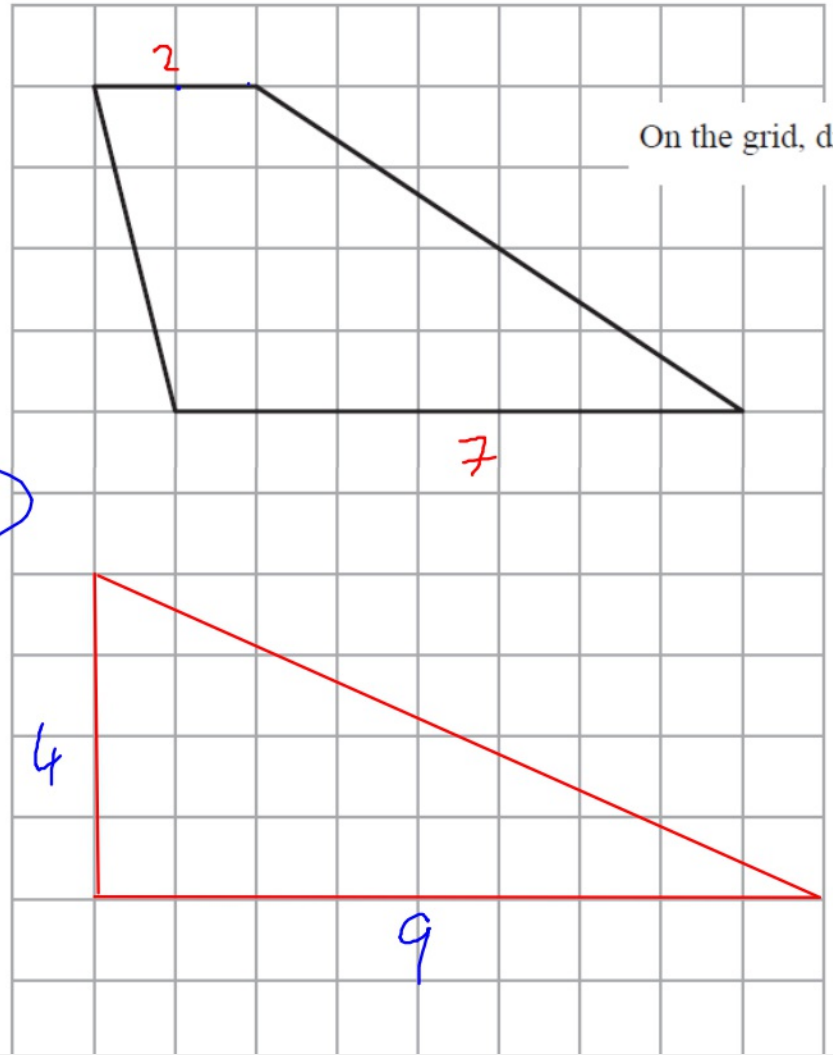
Video created by W Neill

G18
G19



On the grid, draw a triangle equal in area to this trapezium.

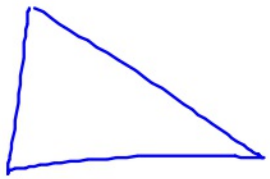
$\frac{1}{2}(a+b)h$

$\frac{1}{2}(2+7)4$

$= 18cm^2$

B x H = 36 ✓

$\frac{36}{2} = 18$



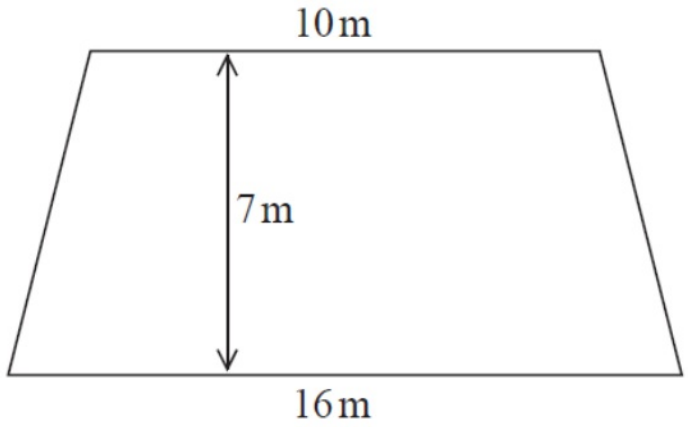
$= 18cm^2$

B x H = 36

$\frac{B \times H}{2} = 18$

(Total for Question 21 is 2 marks)

24 The diagram shows a floor in the shape of a trapezium.



£16.99

John is going to paint the floor.

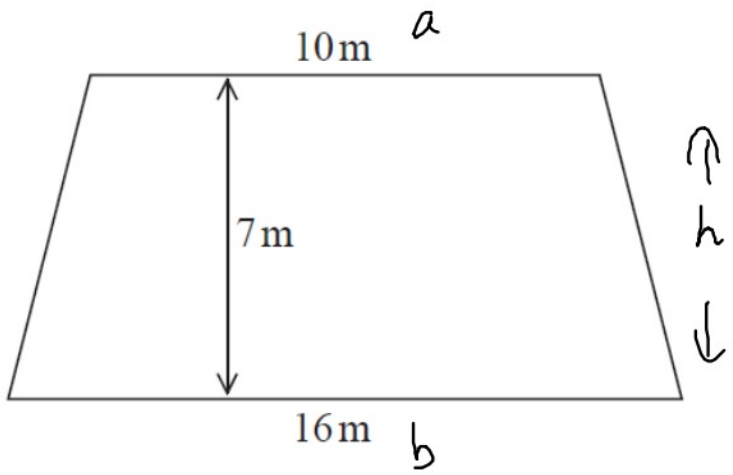
Each 5 litre tin of paint costs £16.99
1 litre of paint covers an area of 2 m^2

John has £160 to spend on paint.

Has John got enough money to buy all the paint he needs?
You must show how you get your answer.

(Total for Question 24 is 5 marks)

24 The diagram shows a floor in the shape of a trapezium.



£16.99

Area = $\frac{1}{2}(a+b)h$

$= \frac{1}{2}(10+16)7$

$= 13 \times 7$

$= 91 m^2$

John is going to paint the floor.

Each 5 litre tin of paint costs £16.99
1 litre of paint covers an area of 2 m^2

1 Litre = $2m^2$

(1 tin) 5 Litres = $10m^2$

John has £160 to spend on paint.

Has John got enough money to buy all the paint he needs?
You must show how you get your answer.

need 10 tins .... $10 \times £16.99$

$= £169.90$

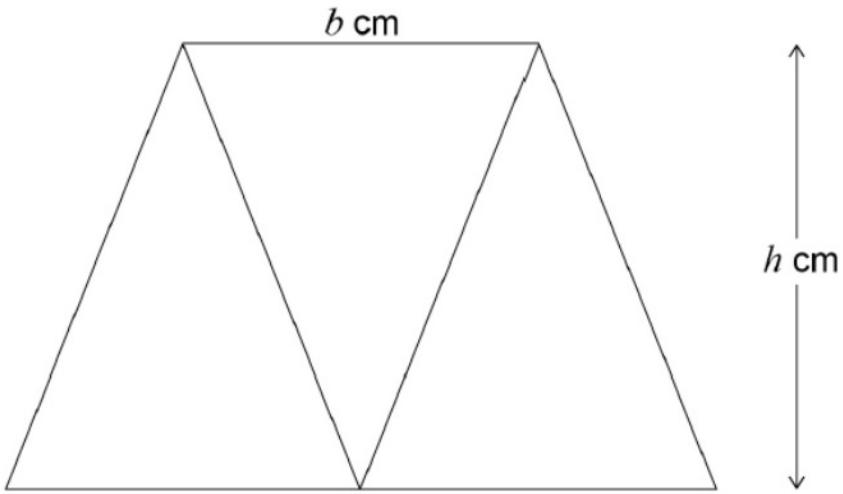
No, he does not have enough.

(Total for Question is 5 marks)

AQA

26 Three identical isosceles triangles are joined to make this trapezium.

Each triangle has base b cm and perpendicular height h cm



Not drawn accurately

26 (a) Work out an expression, in terms of b and h, for the area of the trapezium. **[2 marks]**

Give your answer in its simplest form.

Answer _____ cm^2

Video created by W Neill

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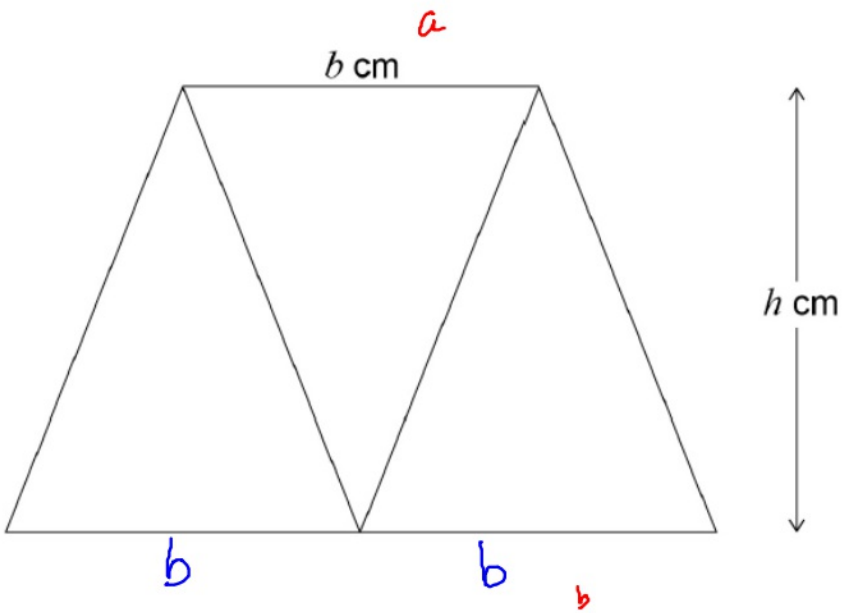


Not drawn accurately

area of trapezium

$= \frac{1}{2}(a+b)h$

$= \frac{1}{2}(3b)h$

(a) Work out an expression, in terms of b and h, for the area of the trapezium. **[2 marks]**

G19

Give your answer in its simplest form.

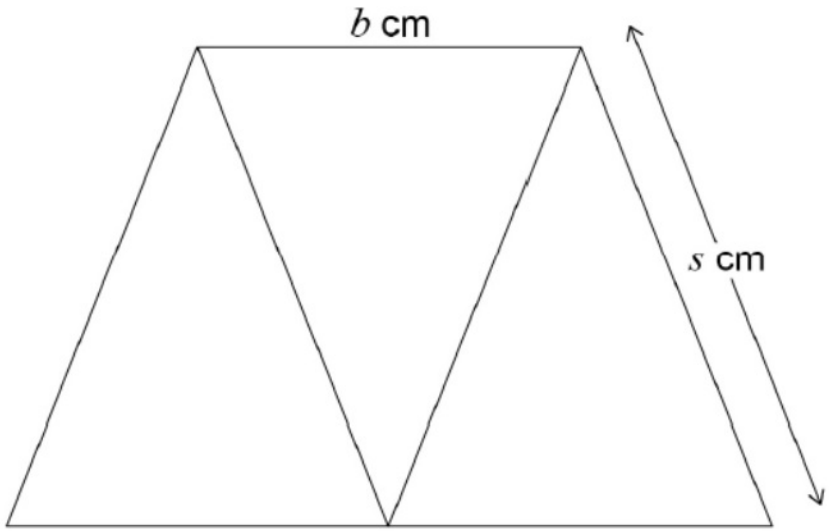
$1\frac{1}{2}b \times h$ ✓

Answer $1.5bh$ ✓ cm^2

Video created by W Neill

26 (b) This diagram shows the same trapezium.

A16



Not drawn accurately

$b : s = 2 : 3$

Work out an expression, in terms of b, for the perimeter of the trapezium.

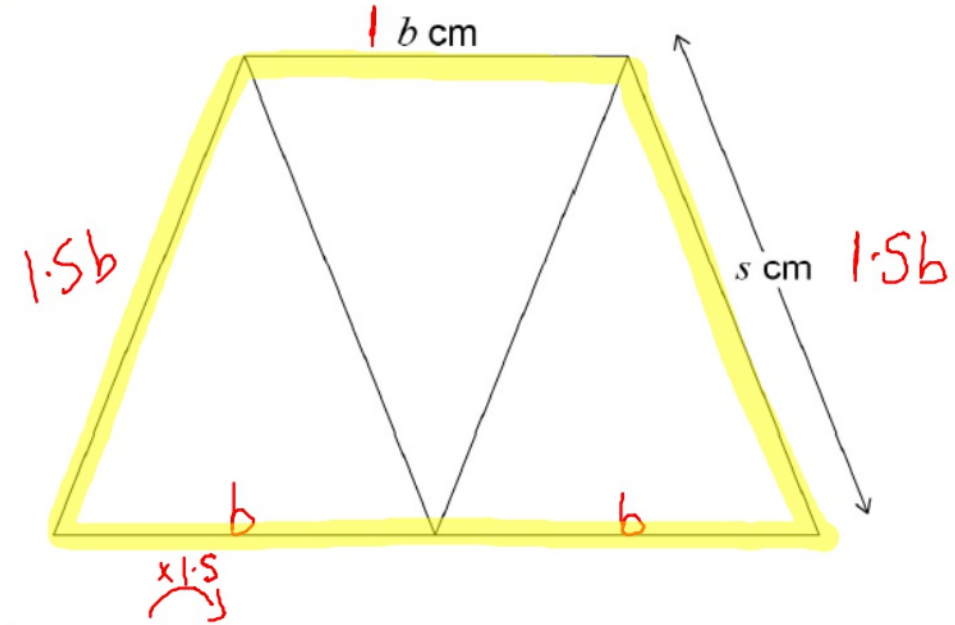
[2 marks]

Answer _____ cm

Video created by W Neill

26 (b) This diagram shows the same trapezium.

A16



Not drawn accurately

$b : s = 2 : 3$

2 : 3

1 : 1·5

$b + 2b + 1{\cdot}5b + 1{\cdot}5b$

$= 6b$

Work out an expression, in terms of b, for the perimeter of the trapezium.

[2 marks]

Answer 6b cm