

Algebra with shapes

How to IMPORTANT...

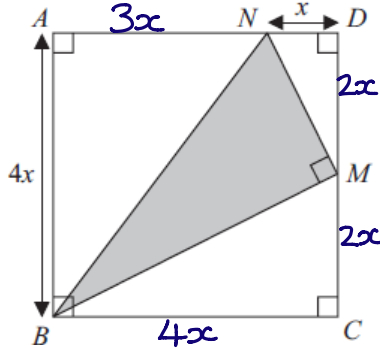
$ABCD$ is a square with a side length of $4x$.

M is the midpoint of DC .

N is the point on AD where $ND = x$

BMN is a right-angled triangle.

Find an expression, in terms of x , for the area of triangle BMN . Give your expression in its simplest form.



- If M is midpoint of DC $DM = 2x$ $MC = 2x$
- As it's a square BC and $AD = 4x$ so $AN = 3x$

$$\text{Area of triangle } BMN = \text{Area of } ABCD - \Delta ANB - \Delta NDM - \Delta MCB$$

$$ABCD = 4x \times 4x = 16x^2$$

$$\Delta ANB = \frac{1}{2} \times 4x \times 3x = 6x^2$$

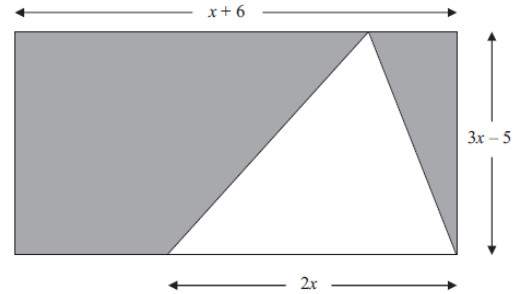
$$\Delta NDM = \frac{1}{2} \times 2x \times x = x^2$$

$$\Delta MCB = \frac{1}{2} \times 4x \times 2x = 4x^2$$

$$\begin{aligned} \text{Triangle } BMN &= 16x^2 - 6x^2 - x^2 - 4x^2 \\ &= 16x^2 - 11x^2 \\ &= \underline{\underline{5x^2}} \end{aligned} \quad (4)$$

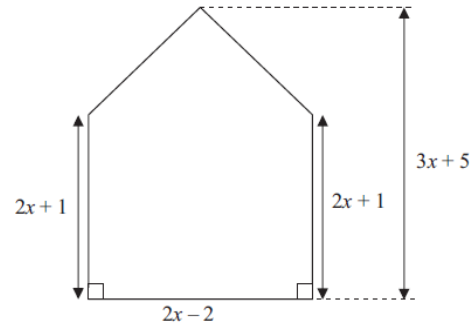
Now have a go yourself ...

(1) The diagram shows a triangle inside a rectangle. All measurements are given in centimetres.



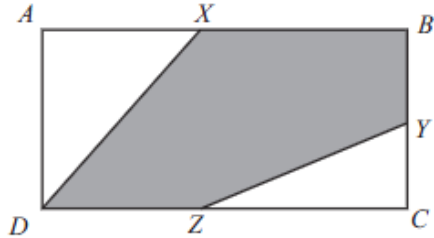
Show that the total area, in cm^2 , of the shaded regions is $18x - 30$

(2) The diagram shows a pentagon. All measurements are given in centimetres.



Show that the area of this pentagon can be written as $5x^2 + x - 6$

Exam Questions



$ABCD$ is a rectangle.

X is the midpoint of AB .

Y is the midpoint of BC .

Z is the midpoint of CD .

What fraction of the total area of $ABCD$ is shaded?

Show clearly how you got your answer.

Ready to be marked ?

Checklist



Answer checked



Working out shown

Keywords



Things to remember ...



What went well ...



Teacher comment ..

(4)