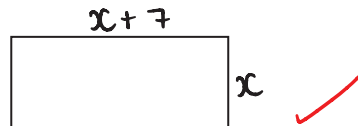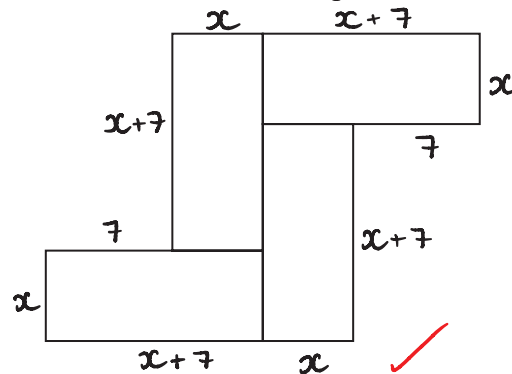**1.**   Here is a rectangle.

$x + 7$

x

The length of the rectangle is 7 cm longer than the width of the rectangle.

4 of these rectangles are used to make this 8-sided shape.

x $x + 7$

$x + 7$ x

7

7 $x + 7$

x

$x + 7$ x

$x + 7 - x$
$= 7$

The perimeter of the 8-sided shape is 70 cm.

Work out the area of the 8-sided shape.

Let x be width of the rectangle

$70 = x + 7 + x + 7 + x + 7 + x + x + 7 + x + 7 + x + 7 + x$

$70 = 8x + 42$
(-42) (-42)
$28 = 8x$
$(\div 8)$ $(\div 8)$
$3.5 = x$

Area of rectangle = width × length
$= x(x+7)$
$= 3.5 \times (3.5 + 7)$
$= 3.5 \times 10.5$
$= 36.25$

$36.25 \times 4 = 147 \text{ cm}^2$

.............147............. cm²

(Total for Question   is 5 marks)

2. *ABC* is an isosceles right-angled triangle.

3*x* cm

A   *B*

3*x* cm

C
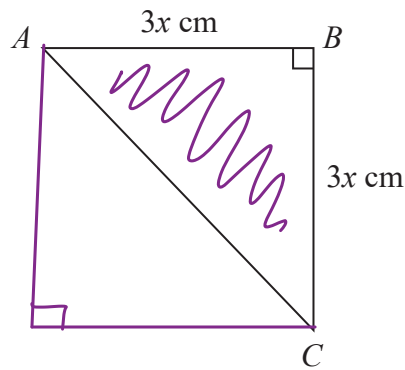
$\triangle$ area $= \frac{1}{2} \square$ area

$= \frac{1}{2} \times$ AB $\times$ BC

$= \frac{1}{2} \times 3x \times 3x$

The area of the triangle is 162 cm²

Work out the value of *x*.

Area of $\triangle$ — setting up an equation in x

$3x \times 3x \times \frac{1}{2} = 162$ ①

$\frac{9}{2} x^2 = 162$

$x^2 = \frac{162 \times 2}{9}$ ①

$x = \sqrt{36}$ x must be positive as you can't have a negative length
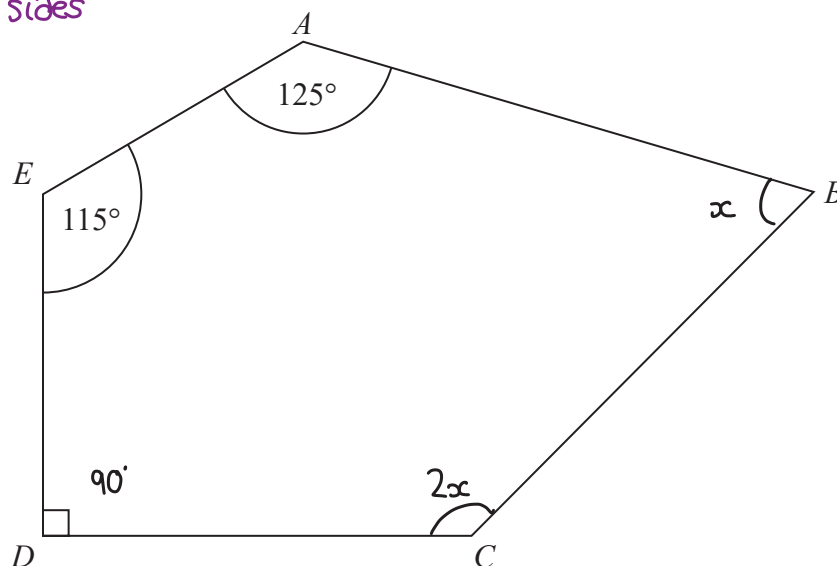
$x = 6$

$x =$ _____6_____ ①

(Total for Question   is 3 marks)

3.   *ABCDE* is a pentagon.

5 sides

Angle *BCD* = 2 × angle *ABC*

Work out the size of angle *BCD*.
You must show all your working.

Let $\angle ABC = x$ $\therefore \angle BCD = 2x$

Sum of interior angles of a pentagon:
                number of sides
$(n-2) \times 180 = (5-2) \times 180$ ①
$= 180 \times 3$
$= 540°$ ①

Setting up an equation in x:

$x + 2x + 90 + 115 + 125 = 540$ ①
$3x = 210$ ①
$x = 70°$

$\angle BCD = 2x = 2 \times 70 = 140°$

140 ①   °
....

(Total for Question   is 5 marks)

4.   Ben is *n* years old.
     Chloe is twice as old as Ben.
     Dan is five years younger than Ben.

     The total of Ben's age, Chloe's age and Dan's age is *T* years.

     (a) Find a formula for *T* in terms of *n*.

Ben is n years old

Chloe is 2n years old

Dan is n-5 years old ①

$$n + 2n + n - 5 = T$$
$$4n - 5 = T$$

②

$$T = 4n - 5$$

(3)

(b) In the table below, put a tick (✓) in the box next to the identity.

$3h + 2 = 14$	
$3a + 4b - 2c$	
$A = \pi r^2$	
$5m - 3m = 2m$ ①	✓
$x + 7 \leqslant 12$	

An equation which is always true no matter what values are substituted

(1)