Lesson 7

7.1 Algebraic perimeter

The perimeter of a shape is the _____ around the outside of the shape.

7.2 Example

A rectangle has a length, in cm, of $x + 3$ and a height of 5 cm.

It has a perimeter is 28 cm.

(**i**)   Calculate the value of *x*.

(**ii**)   Draw the rectangle full size.

(**iii**)   What is the area of the rectangle ?

7.3 Exercise

Question 1
A rectangle has a length, in cm, of $x + 5$ and a height of 7 cm.
It has a perimeter is 38 cm.
(**i**)   Calculate the value of x.
(**ii**)   Draw the rectangle full size.
(**iii**)   What is the area of the rectangle ?

Question 2
A rectangle has a length, in cm, of $x - 7$ and a height of 6 cm.
It has a perimeter is 20 cm.
(**i**)   Calculate the value of x.
(**ii**)   Draw the rectangle full size.
(**iii**)   What is the area of the rectangle ?

Question 3

A rectangle has length and height, in cm, of $x + 3$ and $x + 5$.

It has a perimeter is 40 cm.

(i)   Calculate the value of x.

(ii)   Draw the rectangle full size.

(iii)   What is the area of the rectangle ?

Question 4

A rectangle has a length, in cm, of $x - 5$ and a height, also in cm, of $2x + 3$.

It has a perimeter is 56 cm.

(i)   Calculate the value of x.

(ii)   Draw the rectangle HALF size.

(iii)   What is the area of the (full size) rectangle ?

Question 5

A rectangle has length and height, in cm, of $x + 4$ and $x + 7$ respectively.

It has a perimeter of $x + 46$ cm.

(i)   Calculate the value of x.

(ii)   Draw the rectangle HALF size.

(iii)   What is the area of the (full size) rectangle ?

Question 6

A rectangle has a length, in cm, of $x - 8$ and a height, in cm, of $x + 3$.

It has a perimeter is $x + 32$ cm.

(i)   Calculate the value of x.

(ii)   Draw the rectangle HALF size.

(iii)   What is the area of the (full size) rectangle ?

Question 7

A rectangle has sides, in cm, of $x + 7$, and $x + 4$.

It's AREA is $x^2 + 83$ cm².

(**i**)   Expand the brackets; $(x + 7)(x + 4)$

(**ii**)   Calculate the value of x.

(**iii**)   Draw the rectangle full size.

(**iv**)   What is the area of the rectangle ?

Question 8

A rectangle has a length that is 7 cm more than it's height,
Call its height, x.

(i)   Write down, in terms of x, an expression for the rectangle's length.

(ii)   Write down, in terms of x, an expression for the rectangle's Perimeter.

(iii)   If the rectangle's Perimeter is 26cm, what is
         (a)   The rectangle's length,

         (b)   The rectangle's height

(iv)   Draw the rectangle, full size.
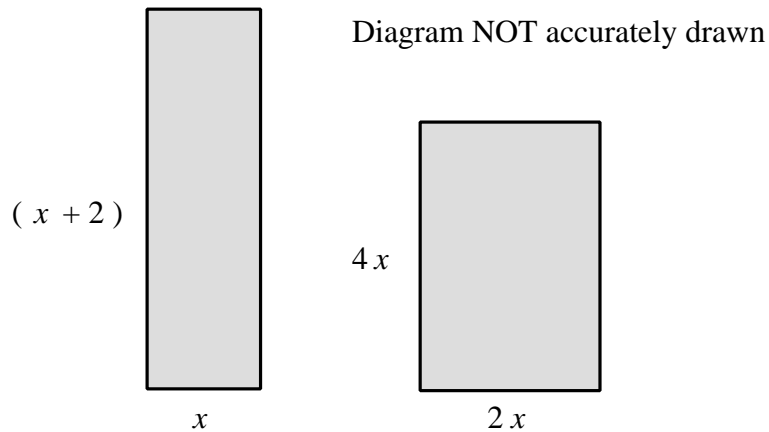
(v)   What is the area of the rectangle ?

Question 9

GCSE Examination Question from January 2013, 3H, Q2

Rectangle **A** has a width of x metres and a height of $(x + 2)$ metres.
Rectangle **B** has a width of $2x$ metres and a height of $4x$ metres.

Diagram NOT accurately drawn

$(x + 2)$

$4x$

x $2x$

The perimeter of rectangle **A** is equal to the perimeter of rectangle **B**.

(i)   Use this information to write down an equation in x.

(ii)   Find the value of x.

[4 marks]