Lesson 10

Perimeter, Area & Volume : Year 9

Non-Calculator

10.1 Starter

(i) Find two numbers that multiply to give 14 and add to give 9.

(ii) Find two numbers that multiply to give 24 and add to give 10.

(iii) Find two numbers that multiply to give 13 and add to give 14.

(iv) Find two numbers that multiply to give 90 and add to give 33.

(v) Find two numbers that multiply to give 24 and add to give 25.

(vi) Find two numbers that multiply to give 18 and add to give 11.

(vii) Find two numbers that multiply to give 40 and add to give 13.

(viii) Find two numbers that multiply to give 100 and add to give 29.

(ix) Find two numbers that multiply to give 34 and add to give 19.

(x) Find two numbers that multiply to give 24 and add to give 11.

10.2 Factorising Quadratics

The command "factorise" means "make brackets".
A quadratic is an expression typically containing some x^2 plus some x plus a number.

10.3 Example

$$x^2 + 8x + 15$$

To factorise this, we need two numbers that multiply to give 15 and add to give 8.
Thus;

$$x^2 + 8x + 15$$
$$= (x + 3)(x + 5)$$

10.4 Exercise

Factorise;

(i) $x^2 + 9x + 8$
Multiply to give 8, add to give 9

(ii) $x^2 + 6x + 9$
Multiply to give 9, add to give 6

(iii) $x^2 + 7x + 12$
Multiply to give 12, add to give 7

(iv) $x^2 + 6x + 5$
Multiply to give 5, add to give 6

(v) $x^2 + 9x + 14$
Multiply to give 14...

(vi) $x^2 + 4x + 3$
Multiply to give 3 ...

(vii) $x^2 + 8x + 12$

(viii) $x^2 + 8x + 15$

(ix) $x^2 + 8x + 16$

(x) $x^2 + 5x + 4$

10.5 Example

At first glance this next question looks the same as the questions already considered.

$$x^2 - 8x + 15$$

And, indeed, to factorise this, we again need two numbers that multiply to give 15 and add to give 8. However, the minus sign in the question results in ***both*** answer brackets containing a minus.

Thus;

$$x^2 - 8x + 15$$

$$= (x - 3)(x - 5)$$

To see that this is correct, check that expanding the brackets of the answer gets back to the question.

10.6 Exercise

Factorise;

(i) $x^2 - 12x + 27$

Multiply to give 27, add to give 12

(ii) $x^2 - 4x + 4$

Multiply to give 4, add to give 4

(iii) $x^2 - 7x + 12$

Multiply to give 12, add to give 7

(iv) $x^2 - 14x + 48$

Multiply to give 48, add to give 14

(v) $x^2 - 17x + 66$

Multiply to give 66, ...

(vi) $x^2 - 8x + 16$

Multiply to give 16, ...

(vii) $x^2 - 5x + 4$

(viii) $x^2 - 11x + 28$

(ix) $x^2 - 17x + 70$

(x) $x^2 - 13x + 40$