SOME PARTICULARLY GOOD FACTORISATIONS WHERE STUDENTS NEED TO CONSIDER ALL POSSIBILITIES.

1. $4x^2 + 5x - 9$

2. $4x^2 + 16x - 9$

3. $4x^2 + 9x - 9$

4. $4x^2 + 12x - 9$

Students need to realise the possible combinations which produce $4x^2$ and 9:

(4x 9)(x 1) — *middle term comes from 9x and 4x (±13x or ±5x)*

(4x 1)(x 9) — *middle term comes from 36x and x (±37x or ±35x)*

(4x 3)(x 3) — *middle term comes from 12x and 3x (±15x or ±9x)*

(2x 9)(2x 1) — *middle term comes from 18x and 2x (±20x or ±16x)*

(2x 3)(2x 3) — *middle term comes from 6x and 6x (±12x or 0x)*

The question from the 2013 paper is like the above:

$6x^2 - 11x - 10$

Possibilities:

(6x 10)(x 1) — *middle term comes from 6x and 10x*
(6x 1)(x 10) — *middle term comes from 60x and 1x*
(6x 5)(x 2) — *middle term comes from 5x and 12x*
(6x 2)(x 5) — *middle term comes from 2x and 30x*
(3x 10)(2x 1) — *middle term comes from 20x and 3x*
(3x 1)(2x 10) — *middle term comes from 2x and 30x*
(3x 5)(2x 2) — *middle term comes from 10x and 6x*
(3x 2)(2x 5) — *middle term comes from 4x and 15x*