

## 1. Factor by $(ax+b)$

**E.827**   Let the expression be:  $E = (5x-2)^2 - (x-7)(5x-2)$

- 1 Expand and reduce  $E$ .
- 2 Calculate the numerical value of  $E$  for  $x = -1$ .
- 3 Factorize  $E$
- 4 Solve equation:  $(5x-2)(4x+5) = 0$

**E.828**    Consider the expression:  
 $C = (2x+5)^2 - (x+3)(2x+5)$

- 1 Expand and simplify  $C$ .
- 2 Factorize  $C$ .
- 3 Solve the equation:  $(2x+5)(x+2) = 0$ .
- 4 Calculate the expression  $C$  for  $x = -\frac{2}{5}$   
*(we will put the result in the form of an irreducible fraction)*

**E.840**   

- 1 Expand and reduce:  $A = (2x-1)^2 - 4(2-x)$
- 2 Factor:  $B = (x-1)^2 + (3x+5)(x-1)$

3 Solve the equation:  $(x-1)(4x+4) = 0$

**E.816**   Consider the expression  $E$ :  $E = (2x+1)^2 - 4$

- 1 Expand and reduce the expression  $E$ .
- 2 Factor the expression  $E$  as a product of factors of the first degree.
- 3 Solve the equation:  $(2x+3)(2x-1) = 0$ .
- 4 Calculate  $E$  when  $x$  is  $-\frac{3}{2}$ , then when  $x$  is 0.

**E.838**  

- 1 Consider the expression:  $E = (x-3)^2 - (x-1)(x-2)$ 
  - a Expand and reduce  $E$ .
  - b How can we deduce, without a calculator, the result of:  $99\,997^2 - 99\,999 \times 99\,998$
- 2 a Factor the expression:  
 $F = (4x+1)^2 - (4x+1)(7x-6)$ 
  - b Solve the equation:  $(4x+1)(7-3x) = 0$

## 2. Factoring by $(ax+b)$ and the square root

**E.839**    Let the expression be:  $D = (2x-3)(3x-1) + (2x-3)^2$

- 1 Expand and reduce  $D$ .
- 2 Factorize  $D$ .
- 3 Calculate  $D$  for  $x = \sqrt{2}$ , write the answer as  $a - b\sqrt{c}$  ( $a$ ,  $b$  and  $c$  integers).
- 4 Solve equation:  $(2x-3)(5x-4) = 0$

**E.830**   

- 1 Consider the following expression  $D$ :

$$D = (2x-3)^2 + (2x-3)(5x+1)$$

- a Expand and reduce the expression  $D$ .
- b Factorize  $D$ .
- 2 Solve the equation:  $(2x-3)(7x-2) = 0$
- 3 We pose:  $E = 14x^2 - 25x + 6$ .  
 Calculate  $E$  for  $x = \sqrt{45}$  and give the result as  $a + b\sqrt{5}$ ,

where  $a$  and  $b$  denote relative integers.

**E.833**     Let be the expression  $A = 9x^2 - 49 + (3x+7)(2x+3)$

- 1 Expand the expression  $A$ .
- 2 Factorize  $9x^2 - 49$ ; then the expression  $A$ .
- 3 Calculate  $A$  for  $x = \sqrt{2}$ . The result will be given as  $a + b\sqrt{2}$
- 4 Solve equation:  $(3x+7)(5x-4) = 0$

**E.815**   Solve the following equations (*results will be given in simplified form*):

a  $4x + 2 - (5x + 1) = 3 - 3(2x + 1)$

b  $\frac{3x+1}{4} - \frac{2x-4}{3} = 1 + x + \frac{x+1}{6}$

c  $3\sqrt{2} \times x + \sqrt{6} = 9\sqrt{2} \times x - 5\sqrt{6}$