More factorising revision

1 Fully factorise:

a $2x^2 + 5x + 3$ **b** $2x^2 + 7x + 5$ **c** $7x^2 + 9x + 2$

d $3x^2 + 7x + 4$ **e** $3x^2 + 13x + 4$ **f** $3x^2 + 8x + 4$

g $8x^2 + 14x + 3$ **h** $21x^2 + 17x + 2$ **i** $6x^2 + 5x + 1$

j $6x^2 + 19x + 3$ **k** $10x^2 + 17x + 3$ **l** $14x^2 + 37x + 5$

2 Fully factorise:

a $2x^2 - 9x - 5$ **b** $3x^2 + 5x - 2$ **c** $3x^2 - 5x - 2$

d $2x^2 + 3x - 2$ **e** $2x^2 + 3x - 5$ **f** $5x^2 - 14x - 3$

g $5x^2 - 8x + 3$ **h** $11x^2 - 9x - 2$ **i** $3x^2 - 7x - 6$

j $2x^2 - 3x - 9$ **k** $3x^2 - 17x + 10$ **l** $5x^2 - 13x - 6$

m $3x^2 + 10x - 8$ **n** $2x^2 + 17x - 9$ **o** $2x^2 + 9x - 18$

p $2x^2 + 11x - 21$ **q** $15x^2 + x - 2$ **r** $21x^2 - 62x - 3$

s $9x^2 - 12x + 4$ **t** $12x^2 + 17x - 40$ **u** $16x^2 + 34x - 15$

Fully factorise: $-5x^2 - 7x + 6$

We remove -1 as a common factor first.

$$
\begin{aligned}
& -5x^2 - 7x + 6 \\
&= -1[5x^2 + 7x - 6] \\
&= -[5x^2 + 10x - 3x - 6] \\
&= -[5x(x + 2) - 3(x + 2)] \\
&= -[(x + 2)(5x - 3)] \\
&= -(x + 2)(5x - 3)
\end{aligned}
$$

Here, $ac = -30$ and $b = 7$. We need two numbers with a product of -30 and a sum of 7. These are 10 and -3.

3 Fully factorise by first removing -1 as a common factor:

a $-3x^2 - x + 14$ **b** $-5x^2 + 11x - 2$ **c** $-4x^2 - 9x + 9$

d $-9x^2 + 12x - 4$ **e** $-8x^2 - 14x - 3$ **f** $-12x^2 + 16x + 3$

Answers

1 **a** $(2x+3)(x+1)$ **b** $(2x+5)(x+1)$ **c** $(7x+2)(x+1)$
d $(3x+4)(x+1)$ **e** $(3x+1)(x+4)$ **f** $(3x+2)(x+2)$
g $(4x+1)(2x+3)$ **h** $(7x+1)(3x+2)$ **i** $(3x+1)(2x+1)$
j $(6x+1)(x+3)$ **k** $(5x+1)(2x+3)$ **l** $(7x+1)(2x+5)$

2 **a** $(2x+1)(x-5)$ **b** $(3x-1)(x+2)$ **c** $(3x+1)(x-2)$
d $(2x-1)(x+2)$ **e** $(2x+5)(x-1)$ **f** $(5x+1)(x-3)$
g $(5x-3)(x-1)$ **h** $(11x+2)(x-1)$ **i** $(3x+2)(x-3)$
j $(2x+3)(x-3)$ **k** $(3x-2)(x-5)$ **l** $(5x+2)(x-3)$
m $(3x-2)(x+4)$ **n** $(2x-1)(x+9)$ **o** $(2x-3)(x+6)$
p $(2x-3)(x+7)$ **q** $(5x+2)(3x-1)$ **r** $(21x+1)(x-3)$
s $(3x-2)^2$ **t** $(4x-5)(3x+8)$ **u** $(8x-3)(2x+5)$

3 **a** $-(3x+7)(x-2)$ **b** $-(5x-1)(x-2)$
c $-(4x-3)(x+3)$ **d** $-(3x-2)^2$
e $-(4x+1)(2x+3)$ **f** $-(6x+1)(2x-3)$