Revision -Expanding Brackets

Ex1 $(2x+3)(x-4)$

$= 2x^2 + 3x - 8x - 12$

$= 2x^2 - 5x - 12$

Ex2 $(x-3)(2x+1)(x+2)$

$= [2x^2 - 6x + x - 3](x+2)$

$= [2x^2 - 5x - 3](x+2)$

$$
\begin{array}{rrrr}
2x^3 & -5x^2 & -3x & \\
 & +4x^2 & -10x & -6 \\
\hline
2x^3 & -x^2 & -13x & -6 \\
\hline
\end{array}
$$

Exercise

1) $(x+4)(x-1)(x+3)$

$= [x^2 + 4x - x - 4](x+3)$

$= [x^2 + 3x - 4](x+3)$

$$
\begin{array}{rrrr}
x^3 & +3x^2 & -4x & \\
 & +3x^2 & +9x & -12 \\
\hline
\end{array}
$$

$= x^3 + 6x^2 + 5x - 12$

2) $(2x+3)(2x+1)(x-5)$

$= [4x^2 + 6x + 2x + 3](x-5)$

$= [4x^2 + 8x + 3](x-5)$

$$\begin{array}{rl} = & 4x^3 + 8x^2 + 3x \\ & \quad -20x^2 - 40x - 15 \\ \hline = & 4x^3 - 12x^2 - 37x - 15 \end{array}$$

Revision-Factorising

Ex1 $x^2 + 5x + 6$

$= (x+2)(x+3)$

+1	+6
−1	−6
+2	+3 ✓
−2	−3

Ex2 $x^2 - 4x + 3$

$= (x-1)(x-3)$

+1	+3
−1	−3 ✓

Ex3 $x^2 - 3x - 10$

$= (x+2)(x-5)$

+1	−10
−1	+10
+2	−5 ✓
−2	+5

Ex 4 $x^2 + x - 12 = 0$

$= (x-3)(x+4) = 0$

Either $x - 3 = 0$ or $x + 4 = 0$

$\underline{x = 3}$ $\underline{x = -4}$

+1	−12
−1	+12
+2	−6
−2	+6
+3	−4
−3	+4 ✓

Exercise Factorise

1) $x^2 + 11x + 30$

$= (x+5)(x+6)$

2) $x^2 - 10x + 16$

$= (x-2)(x-8)$

3) $x^2 - 7x - 8$

$= (x+1)(x-8)$

4) $x^2 + 5x - 14$

$= (x-2)(x+7)$

Factorising with Multiple x^2

Ex1 $2x^2 + 7x + 3$

$2 \times 3 = 6$

$+1 \quad +6$

$= 2x^2 + x + 6x + 3$

$= x(2x+1) + 3(2x+1)$

$= (2x+1)(x+3)$

Ex2

3×-10
$= -30$
$+5 \quad -6$

$$3x^2 - x - 10$$
$$= 3x^2 + 5x - 6x - 10$$
$$= x(3x+5) - 2(3x+5)$$
$$= (3x+5)(x-2)$$

Ex3

4×-5
$= -20$
$+2 \quad -10$
$-2 \quad +10$ ✓

$$4x^2 + 8x - 5$$
$$= 4x^2 - 2x + 10x - 5$$
$$= 2x(2x-1) + 5(2x-1)$$
$$= (2x-1)(2x+5)$$

Exercise Factorise

1) $2 \times 7 = 14$
$+2 \quad +7$

$$2x^2 + 9x + 7$$
$$= 2x^2 + 2x + 7x + 7$$
$$= 2x(x+1) + 7(x+1)$$
$$= (x+1)(2x+7)$$

2)

$3x - 8 = -24$
$-2 \quad +12$

$$3x^2 + 10x - 8$$
$$= 3x^2 - 2x + 12x - 8$$
$$= x(3x-2) + 4(3x-2)$$
$$= (3x-2)(x+4)$$

3) $5x^2 - 7x - 6$

$5x - 6 = -30$

$+3 \quad -10$

$= 5x^2 + 3x - 10x - 6$

$= x(5x+3) - 2(5x+3)$

$= (5x+3)(x-2)$

4) $4x^2 + 19x - 5$

$4x - 5$

$= -20$

$-1 \quad +20$

$= 4x^2 - x + 20x - 5$

$= x(4x-1) + 5(4x-1)$

$= (4x-1)(x+5)$

Factorise Difference of Two Squares

$$(a+b)(a-b) = a^2 - b^2$$

$x^2 - 25 = x^2 - 5^2 = (x+5)(x-5)$

$y^2 - 81 = y^2 - 9^2 = (y+9)(y-9)$

$4x^2 - 49 = (2x)^2 - 7^2 = (2x+7)(2x-7)$

Exercise

1) $x^2 - 100 = x^2 - 10^2 = (x+10)(x-10)$

2) $9x^2 - 16 = (3x)^2 - 4^2 = (3x+4)(3x-4)$

3) $25x^2 - 36 = (5x)^2 - 6^2 = (5x+6)(5x-6)$