EXERCICE 2C.1

Factoriser le polynôme, comme dans l'exemple :

$A(x) = (x+3)^2 - 2$ **$= (x+3)^2 - (\sqrt{2})^2$** **$= (x+3+\sqrt{2})(x+3-\sqrt{2})$**		$B(x) = (x-5)^2 - 3$
$C(x) = (x+5)^2 - 7$	$D(x) = (x-3)^2 - 16$	$E(x) = (x-7)^2 - 2$
$F(x) = (2x-3)^2 - 11$	$G(x) = (3x+5)^2 - 25$	$H(x) = (5x-1)^2 - 4$

EXERCICE 2C.2

Ecrire sous forme canonique puis factoriser le polynôme, comme dans l'exemple :

$A(x) = x^2 - 6x + 6$ **$A(x) = \underline{x^2 - 6x + 9} - 9 + 6$** **$A(x) = (x-3)^2 - 3$** **$A(x) = (x-3)^2 - (\sqrt{3})^2$** **$A(x) = (x-3+\sqrt{3})(x-3-\sqrt{3})$**		$B(x) = x^2 + 8x + 3$
$C(x) = x^2 - 4x - 1$	$D(x) = x^2 - 5x - 1$	$E(x) = x^2 + 3x - 5$
$F(x) = 2x^2 - 12x + 8$	$G(x) = 2x^2 + 7x + 3$	$H(x) = 3x^2 + 15x - 7$

CORRIGE – NOTRE DAME DE LA MERCI - *MONTPELLIER*

EXERCICE 2C.1 Factoriser le polynôme, comme dans l'exemple :

A(x) $= (x+3)^2 - 2$
$= (x+3)^2 - (\sqrt{2})^2$
$= (x+3+\sqrt{2})(x+3-\sqrt{2})$

$B(x) = (x-5)^2 - 3$
$B(x) = (x-5)^2 - (\sqrt{3})^2$
$B(x) = (x-5+\sqrt{3})(x-5-\sqrt{3})$

$C(x) = (x+5)^2 - 7$
$C(x) = (x+5)^2 - (\sqrt{7})^2$
$C(x) = (x+5+\sqrt{7})(x+5-\sqrt{7})$

$D(x) = (x-3)^2 - 16$
$D(x) = (x-3)^2 - 4^2$
$D(x) = (x-3+4)(x-3-4)$
$D(x) = (x+1)(x-7)$

$E(x) = (x-7)^2 - 2$
$E(x) = (x-7)^2 - (\sqrt{2})^2$
$E(x) = (x-7+\sqrt{2})(x-7-\sqrt{2})$

$F(x) = (2x-3)^2 - 11$
$F(x) = (2x-3)^2 - (\sqrt{11})^2$
$F(x) = (2x-3+\sqrt{11})(2x-3-\sqrt{11})$

$G(x) = (3x+5)^2 - 25$
$G(x) = (3x+5)^2 - 5^2$
$G(x) = (3x+5+5)(3x+5-5)$
$G(x) = 3x(3x+10)$

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

EXERCICE 2C.2 Ecrire sous forme canonique puis factoriser le polynôme, comme dans l'exemple :

A(x) $= x^2 + 6x + 5$
$= x^2 + \underline{2 \times 3 \times x} + 5$
$= (x^2 + 2 \times 3 \times x + \underline{3^2}) - \underline{3^2} + 5$
$= (x+3)^2 - \underline{9} + 5$
$= (x+3)^2 - 4$
$= (x+3)^2 - 2^2$
$= (x+3+2)(x+3-2)$
$= (x+5)(x+1)$

$B(x) = x^2 + 8x + 3$
$B(x) = x^2 + 2 \times x \times 4 + 3$
$B(x) = (x^2 + 2 \times x \times 4 + 4^2) - 4^2 + 3$
$B(x) = (x+4)^2 - 16 + 3$
$B(x) = (x+4)^2 - 13$
$B(x) = (x+4)^2 - (\sqrt{13})^2$
$B(x) = (x+4+\sqrt{13})(x+4-\sqrt{13})$

$C(x) = x^2 - 4x - 1$
$C(x) = x^2 - 2 \times x \times 2 - 1$
$C(x) = (x^2 - 2 \times x \times 2 + 2^2) - 2^2 - 1$
$C(x) = (x-2)^2 - 4 - 1$
$C(x) = (x-2)^2 - 5$
$C(x) = (x-2)^2 - (\sqrt{5})^2$
$C(x) = (x-2+\sqrt{5})(x-2-\sqrt{5})$

$D(x) = x^2 - 5x - 1$
$D(x) = x^2 - 2 \times x \times \frac{5}{2} - 1$
$D(x) = \left(x^2 - 2 \times x \times \frac{5}{2} + \left(\frac{5}{2}\right)^2\right) - \left(\frac{5}{2}\right)^2 - 1$
$D(x) = \left(x - \frac{5}{2}\right)^2 - \frac{25}{4} - 1$
$D(x) = \left(x - \frac{5}{2}\right)^2 - \frac{29}{4}$
$D(x) = \left(x - \frac{5}{2}\right)^2 - \left(\sqrt{\frac{29}{4}}\right)^2$
$D(x) = \left(x - \frac{5}{2} + \frac{\sqrt{29}}{2}\right)\left(x - \frac{5}{2} - \frac{\sqrt{29}}{2}\right)$

$$E(x)=x^2+3x-5$$
$$E(x)=x^2+\mathbf{2}\times x\times\frac{\mathbf{3}}{\mathbf{2}}-5$$
$$E(x)=\left(x^2+2\times x\times\frac{3}{2}+\left(\frac{\mathbf{3}}{\mathbf{2}}\right)^{\mathbf{2}}\right)-\left(\frac{\mathbf{3}}{\mathbf{2}}\right)^{\mathbf{2}}-5$$
$$E(x)=\left(x+\frac{3}{2}\right)^2-\frac{9}{4}-5$$
$$E(x)=\left(x+\frac{3}{2}\right)^2-\frac{29}{4}$$
$$E(x)=\left(x+\frac{3}{2}\right)^2-\left(\sqrt{\frac{29}{4}}\right)^2$$
$$E(x)=\left(x+\frac{3}{2}+\frac{\sqrt{29}}{2}\right)\left(x+\frac{3}{2}-\frac{\sqrt{29}}{2}\right)$$

$$F(x)=2x^2-12x+8$$
$$F(x)=2\left(x^2-6x+4\right)$$
$$F(x)=2\left(x^2-\mathbf{2}\times x\times\mathbf{3}+4\right)$$
$$F(x)=2\left[\left(x^2-2\times x\times 3+\mathbf{3^2}\right)-\mathbf{3^2}+4\right]$$
$$F(x)=2\left[(x-3)^2-9+4\right]$$
$$F(x)=2\left[(x-3)^2-5\right]$$
$$F(x)=2\left[(x-3)^2-\left(\sqrt{5}\right)^2\right]$$
$$F(x)=2\left[\left(x-3+\sqrt{5}\right)\left(x-3-\sqrt{5}\right)\right]$$

$$G(x)=2x^2+7x+3$$
$$G(x)=2\left(x^2+\frac{7}{2}x+\frac{3}{2}\right)$$
$$G(x)=2\left(x^2+\mathbf{2}\times x\times\frac{\mathbf{7}}{\mathbf{4}}+\frac{3}{2}\right)$$
$$G(x)=2\left[\left(x^2+2\times x\times\frac{7}{4}+\left(\frac{\mathbf{7}}{\mathbf{4}}\right)^{\mathbf{2}}\right)-\left(\frac{\mathbf{7}}{\mathbf{4}}\right)^{\mathbf{2}}+\frac{3}{2}\right]$$
$$G(x)=2\left[\left(x+\frac{7}{4}\right)^2-\frac{49}{16}+\frac{3}{2}\right]$$
$$G(x)=2\left[\left(x+\frac{7}{4}\right)^2-\frac{49}{16}+\frac{24}{16}\right]$$
$$G(x)=2\left[\left(x+\frac{7}{4}\right)^2-\frac{25}{16}\right]$$
$$G(x)=2\left[\left(x+\frac{7}{4}\right)^2-\left(\frac{5}{4}\right)^2\right]$$
$$G(x)=2\left[\left(x+\frac{7}{4}+\frac{5}{4}\right)\left(x+\frac{7}{4}-\frac{5}{4}\right)\right]$$
$$G(x)=2\left[\left(x+\frac{12}{4}\right)\left(x+\frac{2}{4}\right)\right]$$
$$G(x)=2\left[(x+3)\left(x+\frac{1}{2}\right)\right]$$

$$H(x)=3x^2+15x-7$$
$$H(x)=3\left(x^2+5x-\frac{7}{3}\right)$$
$$H(x)=3\left(x^2+\mathbf{2}\times x\times\frac{\mathbf{5}}{\mathbf{2}}-\frac{7}{3}\right)$$
$$H(x)=3\left[\left(x^2+\mathbf{2}\times x\times\frac{\mathbf{5}}{\mathbf{2}}+\left(\frac{\mathbf{5}}{\mathbf{2}}\right)^{\mathbf{2}}\right)-\left(\frac{\mathbf{5}}{\mathbf{2}}\right)^{\mathbf{2}}-\frac{7}{3}\right]$$
$$H(x)=3\left[\left(x+\frac{5}{2}\right)^2-\frac{25}{4}-\frac{7}{3}\right]$$
$$H(x)=3\left[\left(x+\frac{5}{2}\right)^2-\frac{75}{12}-\frac{28}{12}\right]$$
$$H(x)=3\left[\left(x+\frac{5}{2}\right)^2-\frac{103}{12}\right]$$
$$H(x)=3\left[\left(x+\frac{5}{2}\right)^2-\left(\sqrt{\frac{103}{12}}\right)^2\right]$$
$$H(x)=3\left[\left(x+\frac{5}{2}+\sqrt{\frac{103}{12}}\right)\left(x+\frac{5}{2}-\sqrt{\frac{103}{12}}\right)\right]$$