

## CORRIGE – NOTRE DAME DE LA MERCI - MONTPELLIER

## EXERCICE 2.1

Factoriser le polynôme, comme dans l'exemple :

$\begin{aligned} A(x) &= (x+3)^2 - 2 \\ &= (x+3)^2 - (\sqrt{2})^2 \\ &= (x+3+\sqrt{2})(x+3-\sqrt{2}) \end{aligned}$		$B(x) = (x-5)^2 - 3$ $B(x) = (x-5)^2 - (\sqrt{3})^2$ $B(x) = (x-5+\sqrt{3})(x-5-\sqrt{3})$
$C(x) = (x+5)^2 - 7$ $C(x) = (x+5)^2 - (\sqrt{7})^2$ $C(x) = (x+5+\sqrt{7})(x+5-\sqrt{7})$	$D(x) = (x-3)^2 - 16$ $D(x) = (x-3)^2 - 4^2$ $D(x) = (x-3+4)(x-3-4)$ $D(x) = (x+1)(x-7)$	$E(x) = (x-7)^2 - 2$ $E(x) = (x-7)^2 - (\sqrt{2})^2$ $E(x) = (x-7+\sqrt{2})(x-7-\sqrt{2})$
$F(x) = (2x-3)^2 - 11$ $F(x) = (2x-3)^2 - (\sqrt{11})^2$ $F(x) = (2x-3+\sqrt{11})(2x-3-\sqrt{11})$	$G(x) = (3x+5)^2 - 25$ $G(x) = (3x+5)^2 - 5^2$ $G(x) = (3x+5+5)(3x+5-5)$ $G(x) = 3x(3x+10)$	$H(x) = (5x-1)^2 - 4$ $H(x) = (5x-1)^2 - 2^2$ $H(x) = (5x-1+2)(5x-1-2)$ $H(x) = (5x+1)(5x-3)$

## EXERCICE 2.2

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

$\begin{aligned} A(x) &= x^2 + 6x + 5 \\ &= x^2 + \underline{2 \times 3 \times x} + 5 \\ &= (x^2 + \underline{2 \times 3 \times x} + \underline{3^2}) - \underline{3^2} + 5 \\ &= (x+3)^2 - \underline{9} + 5 \\ &= (x+3)^2 - 4 \\ &= (x+3)^2 - 2^2 \\ &= (x+3+2)(x+3-2) \\ &= (x+5)(x+1) \end{aligned}$	$B(x) = x^2 + 8x + 3$ $B(x) = x^2 + \underline{2 \times x \times 4} + 3$ $B(x) = (x^2 + \underline{2 \times x \times 4} + \underline{4^2}) - \underline{4^2} + 3$ $B(x) = (x+4)^2 - 16 + 3$ $B(x) = (x+4)^2 - 13$ $B(x) = (x+4)^2 - (\sqrt{13})^2$ $B(x) = (x+4+\sqrt{13})(x+4-\sqrt{13})$
$C(x) = x^2 - 4x - 1$ $C(x) = x^2 - \underline{2 \times x \times 2} - 1$ $C(x) = (x^2 - \underline{2 \times x \times 2} + \underline{2^2}) - \underline{2^2} - 1$ $C(x) = (x-2)^2 - 4 - 1$ $C(x) = (x-2)^2 - 5$ $C(x) = (x-2)^2 - (\sqrt{5})^2$ $C(x) = (x-2+\sqrt{5})(x-2-\sqrt{5})$	$D(x) = x^2 - 5x - 1$ $D(x) = x^2 - \underline{2 \times x \times \frac{5}{2}} - 1$ $D(x) = \left( x^2 - \underline{2 \times x \times \frac{5}{2}} + \left( \frac{5}{2} \right)^2 \right) - \left( \frac{5}{2} \right)^2 - 1$ $D(x) = \left( x - \frac{5}{2} \right)^2 - \frac{25}{4} - 1$ $D(x) = \left( x - \frac{5}{2} \right)^2 - \frac{29}{4}$ $D(x) = \left( x - \frac{5}{2} \right)^2 - \left( \sqrt{\frac{29}{4}} \right)^2$ $D(x) = \left( x - \frac{5}{2} + \frac{\sqrt{29}}{2} \right) \left( x - \frac{5}{2} - \frac{\sqrt{29}}{2} \right)$

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

$$E(x) = x^2 + 2 \times x \times \frac{3}{2} - 5$$

$$E(x) = \left( x^2 + 2 \times x \times \frac{3}{2} + \left( \frac{3}{2} \right)^2 \right) - \left( \frac{3}{2} \right)^2 - 5$$

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

$$E(x) = \left( x + \frac{3}{2} \right)^2 - \frac{29}{4}$$

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

$$E(x) = \left( x + \frac{3}{2} + \frac{\sqrt{29}}{2} \right) \left( x + \frac{3}{2} - \frac{\sqrt{29}}{2} \right)$$

$$F(x) = 2x^2 - 12x + 8$$

$$F(x) = 2(x^2 - 6x + 4)$$

$$F(x) = 2(x^2 - 2 \times x \times 3 + 4)$$

$$F(x) = 2 \left[ (x^2 - 2 \times x \times 3 + 3^2) - 3^2 + 4 \right]$$

$$F(x) = 2 \left[ (x-3)^2 - 9 + 4 \right]$$

$$F(x) = 2 \left[ (x-3)^2 - 5 \right]$$

$$F(x) = 2 \left[ (x-3)^2 - (\sqrt{5})^2 \right]$$

$$F(x) = 2 \left[ (x-3+\sqrt{5})(x-3-\sqrt{5}) \right]$$

$$G(x) = 2x^2 + 7x + 3$$

$$G(x) = 2 \left( x^2 + \frac{7}{2}x + \frac{3}{2} \right)$$

$$G(x) = 2 \left( x^2 + 2 \times x \times \frac{7}{4} + \frac{3}{2} \right)$$

$$G(x) = 2 \left[ \left( x^2 + 2 \times x \times \frac{7}{4} + \left( \frac{7}{4} \right)^2 \right) - \left( \frac{7}{4} \right)^2 + \frac{3}{2} \right]$$

$$G(x) = 2 \left[ \left( x + \frac{7}{4} \right)^2 - \frac{49}{16} + \frac{3}{2} \right]$$

$$G(x) = 2 \left[ \left( x + \frac{7}{4} \right)^2 - \frac{49}{16} + \frac{24}{16} \right]$$

$$G(x) = 2 \left[ \left( x + \frac{7}{4} \right)^2 - \frac{25}{16} \right]$$

$$G(x) = 2 \left[ \left( x + \frac{7}{4} \right)^2 - \left( \frac{5}{4} \right)^2 \right]$$

$$G(x) = 2 \left[ \left( x + \frac{7}{4} + \frac{5}{4} \right) \left( x + \frac{7}{4} - \frac{5}{4} \right) \right]$$

$$G(x) = 2 \left[ \left( x + \frac{12}{4} \right) \left( x + \frac{2}{4} \right) \right]$$

$$G(x) = 2 \left[ (x+3) \left( x + \frac{1}{2} \right) \right]$$

$$H(x) = 3x^2 + 15x - 7$$

$$H(x) = 3 \left( x^2 + 5x - \frac{7}{3} \right)$$

$$H(x) = 3 \left( x^2 + 2 \times x \times \frac{5}{2} - \frac{7}{3} \right)$$

$$H(x) = 3 \left[ \left( x^2 + 2 \times x \times \frac{5}{2} + \left( \frac{5}{2} \right)^2 \right) - \left( \frac{5}{2} \right)^2 - \frac{7}{3} \right]$$

$$H(x) = 3 \left[ \left( x + \frac{5}{2} \right)^2 - \frac{25}{4} - \frac{7}{3} \right]$$

$$H(x) = 3 \left[ \left( x + \frac{5}{2} \right)^2 - \frac{75}{12} - \frac{28}{12} \right]$$

$$H(x) = 3 \left[ \left( x + \frac{5}{2} \right)^2 - \frac{103}{12} \right]$$

$$H(x) = 3 \left[ \left( x + \frac{5}{2} \right)^2 - \left( \sqrt{\frac{103}{12}} \right)^2 \right]$$

$$H(x) = 3 \left[ \left( x + \frac{5}{2} + \sqrt{\frac{103}{12}} \right) \left( x + \frac{5}{2} - \sqrt{\frac{103}{12}} \right) \right]$$