

Factoriser au maximum.

$$a) 3x^2 + 15x - 42 \stackrel{\text{Hee}}{=} 3(x^2 + 5x - 14) \stackrel{\text{SP}}{=} \underline{3(x+7)(x-2)}$$

$$b) -x^4 + 6x^3 - 12x^2 + 8x \stackrel{\text{Hee}}{=} -x(x^3 - 6x^2 + 12x - 8) \stackrel{\text{PR}}{=} \underline{-x(x-2)^3}$$

$$c) x^4 - 7x^3 + 6x^2 \stackrel{\text{Hee}}{=} x^2(x^2 - 7x + 6) \stackrel{\text{SP}}{=} \underline{x^2(x-6)(x-1)}$$

$$d) x^4 + 5x^2 + 4 \stackrel{y=x^2}{=} y^2 + 5y + 4 \stackrel{\text{SP}}{=} (y+4)(y+1) \\ = \underline{(x^2+4)(x^2+1)}$$

$$e) x^4 + 2x^2 + 1 \stackrel{\text{PR}}{=} \underline{(x^2+1)^2}$$

$$f) (x-1)(y^2+3) - (1-x) \stackrel{+ (x-1)}{\stackrel{\text{Hee}}{=}} (x-1)[(y^2+3)+1] = \underline{(x-1)(y^2+4)}$$

$$g) 3x^2 + x - 10 \stackrel{\Delta}{=} 3(x - \frac{5}{3})(x+2) = \underline{(3x-5)(x+2)}$$

$$\Delta = 1 - 4 \cdot 3 \cdot (-10) = 121$$

$$x_{1,2} = \frac{-1 \pm 11}{6} = \begin{matrix} \frac{10}{6} = \frac{5}{3} \\ -\frac{12}{6} = -2 \end{matrix}$$

$$h) \underline{x^3 - x^2} - \underline{4x + 4} \stackrel{\text{Gr}}{=} x^2(x-1) - 4(x-1) = (x-1)(x^2-4) \stackrel{\text{PR}}{=} \underline{(x-1)(x+2)(x-1)}$$

$$i) 1 - x^6 \stackrel{\text{PR}}{=} (1+x^3)(1-x^3) \stackrel{\text{PR}}{=} \underline{(1+x)(1-x+x^2)(1-x)(1+x+x^2)}$$

$$j) \underline{2x^3 - 5x^2} - \underline{8x + 20} \stackrel{\text{Gr}}{=} x^2(2x-5) - 4(2x-5) = (2x-5)(x^2-4) \stackrel{\text{PR}}{=} \underline{(2x-5)(x+2)(x-2)}$$

$$k) 2x^6 - 6x^4 + 6x^2 - 2 \stackrel{\text{Hee}}{=} 2(x^6 - 3x^4 + 3x^2 - 1) \stackrel{\text{PR}}{=} 2(x^2-1)^3 \stackrel{\text{PR}}{=} \underline{2[(x+1)(x-1)]^3 = 2(x+1)^3(x-1)^3}$$

Réponses :

a) $3(x-2)(x+7)$

b) $-x(x-2)^3 = x(-x+2)^3$

c) $x^2(x-6)(x-1)$

d) $(x^2+1)(x^2+4)$

e) $(x^2+1)^2$

f) $(x-1)(y^2+4)$

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

h) $(x-1)(x+2)(x-2)$

i) $(1+x)(1-x+x^2)(1-x)(1+x+x^2)$

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

k) $2(x+1)^3(x-1)^3$