2.3.24 Factoriser si possible les polynômes suivants.

a) $p(x) = x^2 + 19x + 18$

b) $p(x) = x^2 - 4x + 4$

c) $p(x) = 2x^2 + 5x - 3$

d) $p(x) = 3x^2 - 5x + 2$

e) $p(x) = 4x^2 - 20x + 25$

f) $p(x) = x^2 - 9$

g) $p(x) = x^2 - \frac{4}{9}$

h) $p(x) = 9x^2 - 5x$

i) $p(x) = 8x^2 + 6x + 1$

j) $p(x) = \frac{1}{3}x^2 - x + 4$

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a)
$$p = x^2 + 19x + 18$$
$$= (x + 1)(x + 18)$$

b)
$$p = x^2 - 4x + 4$$
$$= (x - 2)(x - 2) = (x - 2)^2$$

c)
$$p = 2x^2 + 5x - 3$$
$$= 2(x - \frac{1}{2})(x + 3) = (2x - 1)(x + 3)$$

Par Δ : $2x^2 + 5x - 3 = 0$

$$\Delta = 25 - 4 \cdot 2(-3) = 25 + 24 = 49 = 7^2$$

$$x_1 = \frac{-5 - 7}{4} = \frac{-12}{4} = -3$$

$$x_2 = \frac{-5 + 7}{4} = \frac{2}{4} = \frac{1}{2}$$

d)
$$p = 3x^2 - 5x + 2$$
$$= (3x - 2)(x - 1)$$

Par Δ : $x_1 = 1$, $x_2 = \frac{2}{3}$: $p = 3(x - 1)(x - \frac{2}{3})$
$$= (x - 1)(3x - 2)$$

f) $p(x) = x^2 - 9 = (x-3)(x+3)$

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

h) $p(x) = 9x^2 - 5x = x(9x - 5)$

i) $p(x) = 8x^2 + 6x + 1 = (4x + 1)(2x + 1)$

j) $p(x) = \frac{1}{3}x^2 - x + 4 = \frac{1}{3}\left(\underbrace{x^2 - 3x + 12}\right)$

$\qquad = \frac{1}{3}x^2 - x + 4$

$A^2 - B^2$

p_1 avec Δ : $\Delta = 9 - 4 \cdot 1 \cdot 12 < 0$
pas de factorisation.