Ceinture bleue 05 - Corrigé

Exercice 1 : Utiliser les identités remarquables

Résoudre les équations suivantes :

1. $(x-7)^2 - 25x^2 = 0$
2. $16x^2 + 4x + \frac{1}{4} = 0$

1. $(x-7)^2 - 25x^2 = 0$
$\iff (x-7)^2 - (5x)^2 = 0$
$\iff (x-7-5x)(x-7+5x) = 0$
$\iff (-4x-7)(6x-7) = 0$
$\iff -4x-7 = 0 \quad \text{ou} \quad 6x-7 = 0$
$\iff -4x = 7 \quad \text{ou} \quad 6x = 7$
$\iff x = -\frac{7}{4} \quad \text{ou} \quad x = \frac{7}{6}$
$\iff x = -1,75 \quad \text{ou} \quad x = \frac{7}{6}$

Donc $\mathcal{S} = \left\{-\frac{7}{4} ; \frac{7}{6}\right\}$.

2. $16x^2 + 4x + \frac{1}{4} = 0$
$\iff (4x)^2 + 2 \times 4x \times \frac{1}{2} + \left(\frac{1}{2}\right)^2 = 0$
$\iff \left(4x + \frac{1}{2}\right)^2 = 0$
$\iff 4x + \frac{1}{2} = 0$
$\iff 4x = -\frac{1}{2}$
$\iff x = -\frac{1}{2} \times \frac{1}{4}$
$\iff x = -\frac{1}{8}$

Donc $\mathcal{S} = \left\{-\frac{1}{8}\right\}$.