

1 : Développer les expressions suivantes :

$$a = (\sqrt{2} + 3)^2 = \sqrt{2}^2 + 2 \times 3\sqrt{2} + 3^2 = 9 + 2 + 6\sqrt{2} = 6\sqrt{2} + 11$$

$$b = (\sqrt{3} - 2)^2 = \sqrt{3}^2 - 2 \times 2\sqrt{3} + 2^2 = 3 - 4\sqrt{3} + 4 = -4\sqrt{3} + 7$$

$$c = (\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2}) = \sqrt{3}^2 - \sqrt{2}^2 = 3 - 2 = 1$$

2 : Mettre le dénominateur des nombres suivantes un nombre naturel :

$$a = \frac{7+\sqrt{7}}{\sqrt{5}+1} = \frac{(7+\sqrt{7})(\sqrt{5}-1)}{(\sqrt{5}+1)(\sqrt{5}-1)} = \frac{(7+\sqrt{7})(\sqrt{5}-1)}{\sqrt{5}^2 - 1^2} = \frac{(7+\sqrt{7})(\sqrt{5}-1)}{5-1} = \frac{(7+\sqrt{7})(\sqrt{5}-1)}{4}$$

$$b = \frac{3}{\sqrt{8}} = \frac{3\sqrt{8}}{\sqrt{8} \times \sqrt{8}} = \frac{3\sqrt{8}}{\sqrt{8}^2} = \frac{3\sqrt{8}}{8} \quad // \quad d = \frac{-1}{\sqrt{3}} = \frac{-1\sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{-\sqrt{3}}{\sqrt{3}^2} = \frac{-\sqrt{3}}{3}$$

$$c = \frac{\sqrt{3}-3}{\sqrt{5}+5} = \frac{(\sqrt{3}-3)(\sqrt{5}-5)}{(\sqrt{5}+5)(\sqrt{5}-5)} = \frac{(\sqrt{3}-3)(\sqrt{5}-5)}{\sqrt{5}^2 - 5^2} = \frac{(\sqrt{3}-3)(\sqrt{5}-5)}{5-25} = -\frac{(7+\sqrt{7})(\sqrt{5}-1)}{20}$$

3 : Factoriser les expressions suivantes :

$$a = x^2 - \frac{16}{9} = x^2 - \left(\frac{4}{3}\right)^2 = \left(x + \frac{4}{3}\right)\left(x - \frac{4}{3}\right)$$

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

$$c = x^2 + 2x\sqrt{2} + 2 = x^2 + 2x\sqrt{2} + \sqrt{2}^2 = (x + \sqrt{2})^2$$

$$d = 3x^2 + 2x\sqrt{3} + 1 = 3x^2 + 2x\sqrt{3} + 1^2 = (x\sqrt{3} + 1)^2$$

4 : Factoriser en utilisant l'identité remarquable qui convient :

✚ Exemple :

$$\begin{aligned} a &= 9x^2 + 6x\sqrt{7} + 7 \quad \text{🔒} \\ &= (3x)^2 + 2 \times 3x \times \sqrt{7} + \sqrt{7}^2 \\ &= (3x + \sqrt{7})^2 \\ b &= 2x^2 + 2x\sqrt{2} + 1 \\ &= (x\sqrt{2})^2 + 2x\sqrt{2} + 1^2 \\ &= (x\sqrt{2} + 1)^2 \\ c &= x^2 + 2x\sqrt{3} + 3 \\ &= x^2 + 2x\sqrt{3} + \sqrt{3}^2 \\ &= (x + \sqrt{3})^2 \end{aligned}$$

✚ Exemple :

$$\begin{aligned} a &= 9x^2 - 3 \quad \text{🔒} \\ &= (3x)^2 - \sqrt{3}^2 \\ &= (3x + \sqrt{3})(3x - \sqrt{3}) \\ b &= y^2 - x^2 \\ &= (y + x)(y - x) \\ c &= (\sqrt{7} - \sqrt{3y})^2 - 3y : \text{Tel que } y \geq 0 \\ &= (\sqrt{7} - \sqrt{3y})^2 - \sqrt{3y}^2 \\ &= [(\sqrt{7} - \sqrt{3y}) - \sqrt{3y}][(\sqrt{7} - \sqrt{3y}) + \sqrt{3y}] \\ &= [\sqrt{7} - \sqrt{3y} - \sqrt{3y}][\sqrt{7} - \sqrt{3y} + \sqrt{3y}] \\ &= [\sqrt{7} - 2\sqrt{3y}][\sqrt{7} - \sqrt{3y} + \sqrt{3y}] \\ &= [\sqrt{7} - 2\sqrt{3y}][\sqrt{7} - 0] \\ &= \sqrt{7}(\sqrt{7} - 2\sqrt{3y}) \end{aligned}$$

✚ Exemple :

$$\begin{aligned} a &= 9x^2 - 6x\sqrt{5} + 5 \\ &= (3x)^2 - 2 \times 3x \times \sqrt{5} + \sqrt{5}^2 \\ &= (3x - \sqrt{5})^2 \\ b &= x^2 - 2x\sqrt{2} + 2 \\ &= x^2 - 2 \times x \times \sqrt{2} + \sqrt{2}^2 \\ &= (x - \sqrt{2})^2 \\ c &= x^2 - 2x\sqrt{5} + 5 \\ &= x^2 - 2 \times x \times \sqrt{5} + \sqrt{5}^2 \\ &= (x - \sqrt{5})^2 \end{aligned}$$

👤 Nom :

👤 Prénom :

Classe : Année : 2021/2022