

Sans calculatrice et en détaillant les calculs, simplifier les expressions suivantes :

$$E = \frac{3}{\sqrt{2}-1} = \frac{3(\sqrt{2}+1)}{(\sqrt{2}-1)(\sqrt{2}+1)} = \frac{3(\sqrt{2}+1)}{2-1} = 3(\sqrt{2}+1) = 3 + 3\sqrt{2}.$$

$$F = \frac{1}{\sqrt{2}+1} + \frac{1}{\sqrt{2}-1} = \frac{\sqrt{2}-1}{(\sqrt{2}+1)(\sqrt{2}-1)} + \frac{\sqrt{2}+1}{(\sqrt{2}-1)(\sqrt{2}+1)} = \frac{\sqrt{2}-1}{2-1} + \frac{\sqrt{2}+1}{2-1} = (\sqrt{2}-1) + (\sqrt{2}+1) = 2\sqrt{2}.$$

$$G = \frac{2\sqrt{3}}{\sqrt{3}+3} + \frac{\sqrt{3}}{\sqrt{3}-3} = \frac{2\sqrt{3}(\sqrt{3}-3)}{(\sqrt{3}+3)(\sqrt{3}-3)} + \frac{\sqrt{3}(\sqrt{3}+3)}{(\sqrt{3}-3)(\sqrt{3}+3)} = \frac{6-6\sqrt{3}}{3-9} + \frac{3+3\sqrt{3}}{3-9} = \frac{6-6\sqrt{3}}{-6} + \frac{3+3\sqrt{3}}{-6}.$$

$$G = (-1 + \sqrt{3}) - \frac{1+\sqrt{3}}{2} = \frac{-2+2\sqrt{3}-1-\sqrt{3}}{2} = \frac{-3+\sqrt{3}}{2}.$$