

العمليات في مجموعة الأعداد الحقيقية

$$A = \frac{\sqrt{5}+1}{\sqrt{5}-3} + \frac{\sqrt{5}+3}{\sqrt{5}-1} = \frac{(\sqrt{5}+1)(\sqrt{5}-1)+(\sqrt{5}+3)(\sqrt{5}-3)}{(\sqrt{5}-3)(\sqrt{5}-1)}$$
$$= \frac{5-\sqrt{5}+\sqrt{5}-1+5-3\sqrt{5}+3\sqrt{5}-9}{5-\sqrt{5}-3\sqrt{5}+3} = 0$$



$$B = \frac{2\sqrt{5}}{\sqrt{5}-2} - \frac{\sqrt{5}}{\sqrt{5}+2} = \frac{2\sqrt{5}(\sqrt{5}+2)-\sqrt{5}(\sqrt{5}-2)}{(\sqrt{5}-2)(\sqrt{5}+2)} = \frac{10+4\sqrt{5}-5+2\sqrt{5}}{5-2\sqrt{5}+2\sqrt{5}-4} = 5 + 6\sqrt{5}$$



$$C = \frac{\sqrt{3}}{\sqrt{3}+2} + \frac{2\sqrt{3}}{\sqrt{3}+1} = \frac{\sqrt{3}(\sqrt{3}+1) + 2\sqrt{3}(\sqrt{3}+1)}{(\sqrt{3}+2)(\sqrt{3}+1)}$$
$$= \frac{3 + \sqrt{3} + 6 + 2\sqrt{3}}{3 + 2\sqrt{3} + \sqrt{3} + 2} = \frac{9 + 3\sqrt{3}}{5 + 3\sqrt{3}} = \frac{(9 + 3\sqrt{3})(5 - 3\sqrt{3})}{(5 + 3\sqrt{3})(5 - 3\sqrt{3})}$$
$$= \frac{45 - 27\sqrt{3} + 15\sqrt{3} - 27}{25 - 15\sqrt{3} + 15\sqrt{3} - 27} = \frac{18 - 12\sqrt{3}}{-2} = 6\sqrt{3} - 9$$



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