

Zadatak 22. Racionaliziraj nazivnik sljedećih razlomaka:

$$1) \frac{3\sqrt{2} - 2\sqrt{5}}{2\sqrt{5} + 3\sqrt{2}}; \quad 2) \frac{2\sqrt{5} + 5\sqrt{2}}{5\sqrt{2} - 2\sqrt{5}};$$

$$3) \frac{2\sqrt{3}}{\sqrt{2} + \sqrt{3} + \sqrt{5}}; \quad 4) \frac{1}{1 + \sqrt{2} + \sqrt{3}}.$$

Rješenje.

$$1) \frac{3\sqrt{2} - 2\sqrt{5}}{2\sqrt{5} + 3\sqrt{2}} \cdot \frac{2\sqrt{5} - 3\sqrt{2}}{2\sqrt{5} - 3\sqrt{2}} = \frac{-(3\sqrt{2} - 2\sqrt{5})^2}{20 - 18} = \frac{12\sqrt{10} - 38}{2} \\ = 6\sqrt{10} - 19;$$

$$2) \frac{5\sqrt{2} + 2\sqrt{5}}{5\sqrt{2} - 2\sqrt{5}} \cdot \frac{5\sqrt{2} + 2\sqrt{5}}{5\sqrt{2} + 2\sqrt{5}} = \frac{(5\sqrt{2} + 2\sqrt{5})^2}{50 - 20} = \frac{70 + 20\sqrt{10}}{50 - 20} \\ = \frac{1}{3}(7 + 2\sqrt{10});$$

$$3) \frac{2\sqrt{3}}{\sqrt{2} + \sqrt{3} + \sqrt{5}} \cdot \frac{(\sqrt{2} + \sqrt{3}) - \sqrt{5}}{(\sqrt{2} + \sqrt{3}) - \sqrt{5}} = \frac{2\sqrt{6} + 6 - 2\sqrt{15}}{(\sqrt{2} + \sqrt{3})^2 - 5} \\ = \frac{2\sqrt{6} + 6 - 2\sqrt{15}}{2\sqrt{6}} = \frac{\sqrt{6} + 3 - \sqrt{15}}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} = \frac{6 + 3\sqrt{6} - 3\sqrt{10}}{6} \\ = 1 + \frac{\sqrt{6}}{2} - \frac{\sqrt{10}}{2};$$

$$4) \frac{1}{1 + \sqrt{2} + \sqrt{3}} \cdot \frac{(1 + \sqrt{2}) - \sqrt{3}}{(1 + \sqrt{2}) - \sqrt{3}} = \frac{1 + \sqrt{2} - \sqrt{3}}{3 + 2\sqrt{2} - 3} = \frac{1 + \sqrt{2} - \sqrt{3}}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \\ = \frac{\sqrt{2} + 2 - \sqrt{6}}{4}.$$