1) $\dfrac{3}{\sqrt{8}} = \dfrac{3}{2\sqrt{2}} = \dfrac{3.\sqrt{2}}{2\sqrt{2}.\sqrt{2}} = \dfrac{3\sqrt{2}}{2.2} = \dfrac{3\sqrt{2}}{4} = \dfrac{3}{4}\sqrt{2}$

2) $\dfrac{\sqrt{20}}{\sqrt{216}} = \dfrac{2\sqrt{5}}{6\sqrt{6}} = \dfrac{2\sqrt{5}.\sqrt{6}}{6\sqrt{6}.\sqrt{6}} = \dfrac{2\sqrt{30}}{6.6} = \dfrac{2\sqrt{30}}{36} = \dfrac{1}{18}\sqrt{30}$

3) $\dfrac{8+\sqrt{3}}{\sqrt{5}} = \dfrac{\left(8+\sqrt{3}\right).\sqrt{5}}{\sqrt{5}.\sqrt{5}} = \dfrac{8\sqrt{5}+\sqrt{15}}{5}$

4) $\dfrac{\sqrt{3}-2}{\sqrt{3}} = \dfrac{\left(\sqrt{3}-2\right).\sqrt{3}}{\sqrt{3}.\sqrt{3}} = \dfrac{3-2\sqrt{3}}{3}$

5) $\dfrac{\sqrt{3}+1}{\sqrt{7}} = \dfrac{\left(\sqrt{3}+1\right).\sqrt{7}}{\sqrt{7}.\sqrt{7}} = \dfrac{\sqrt{21}+\sqrt{7}}{7}$

6) $\dfrac{3}{5-\sqrt{2}} = \dfrac{3.\left(5+\sqrt{2}\right)}{\left(5-\sqrt{2}\right).\left(5+\sqrt{2}\right)} = \dfrac{15+3\sqrt{2}}{5^2-\sqrt{2}^{\,2}} = \dfrac{15+3\sqrt{2}}{25-2} = \dfrac{15+3\sqrt{2}}{23}$

7) $\dfrac{\sqrt{3}}{\sqrt{2}+\sqrt{7}} = \dfrac{\sqrt{3}.\left(\sqrt{2}-\sqrt{7}\right)}{\left(\sqrt{2}+\sqrt{7}\right).\left(\sqrt{2}-\sqrt{7}\right)} = \dfrac{\sqrt{6}-\sqrt{21}}{\sqrt{2}^{\,2}-\sqrt{7}^2} = \dfrac{\sqrt{6}-\sqrt{21}}{2-7} = \dfrac{\sqrt{6}-\sqrt{21}}{-5} = -\dfrac{\sqrt{6}-\sqrt{21}}{5}$

8) $\dfrac{6}{\sqrt{5}-\sqrt{2}} = \dfrac{6.\left(\sqrt{5}+\sqrt{2}\right)}{\left(\sqrt{5}-\sqrt{2}\right).\left(\sqrt{5}+\sqrt{2}\right)} = \dfrac{6\sqrt{5}+6\sqrt{2}}{\sqrt{5}^{\,2}-\sqrt{2}^2} = \dfrac{6\sqrt{5}+6\sqrt{2}}{5-2} = \dfrac{6\sqrt{5}+6\sqrt{2}}{3} = 2\sqrt{5}+2\sqrt{2}$