1.8

1) $\dfrac{1}{\sqrt{2}+1}+\dfrac{1}{\sqrt{2}-1}=\dfrac{1\left(\sqrt{2}-1\right)}{\left(\sqrt{2}+1\right)\left(\sqrt{2}-1\right)}+\dfrac{1\left(\sqrt{2}+1\right)}{\left(\sqrt{2}-1\right)\left(\sqrt{2}+1\right)}$

$$=\frac{\sqrt{2}-1}{1}+\frac{\sqrt{2}+1}{1}=2\sqrt{2}$$

2) $\dfrac{\sqrt{3}-1}{\sqrt{3}+\sqrt{2}}+\dfrac{\sqrt{3}+1}{\sqrt{3}+\sqrt{2}}=\dfrac{2\sqrt{3}}{\sqrt{3}+\sqrt{2}}=\dfrac{2\sqrt{3}\left(\sqrt{3}-\sqrt{2}\right)}{\left(\sqrt{3}+\sqrt{2}\right)\left(\sqrt{3}-\sqrt{2}\right)}$

$$=\frac{6-2\sqrt{6}}{1}=6-2\sqrt{6}$$

3) $\dfrac{10+3\sqrt{21}}{\sqrt{3}+\sqrt{7}}+\dfrac{10-2\sqrt{21}}{\sqrt{3}-\sqrt{7}}$

$$=\frac{\left(10+3\sqrt{21}\right)\left(\sqrt{3}-\sqrt{7}\right)}{\left(\sqrt{3}+\sqrt{7}\right)\left(\sqrt{3}-\sqrt{7}\right)}+\frac{\left(10-2\sqrt{21}\right)\left(\sqrt{3}+\sqrt{7}\right)}{\left(\sqrt{3}-\sqrt{7}\right)\left(\sqrt{3}+\sqrt{7}\right)}$$

$$=\frac{10\sqrt{3}-10\sqrt{7}+9\sqrt{7}-21\sqrt{3}}{-4}+\frac{10\sqrt{3}+10\sqrt{7}-6\sqrt{7}-14\sqrt{3}}{-4}$$

$$=\frac{-15\sqrt{3}+3\sqrt{7}}{-4}=\frac{15\sqrt{3}-3\sqrt{7}}{4}$$

4) $\dfrac{2}{3-\sqrt{5}}+\dfrac{3\sqrt{2}}{2-\sqrt{2}}=\dfrac{2\left(3+\sqrt{5}\right)}{\left(3-\sqrt{5}\right)\left(3+\sqrt{5}\right)}+\dfrac{3\sqrt{2}\left(2+\sqrt{2}\right)}{\left(2-\sqrt{2}\right)\left(2+\sqrt{2}\right)}$

$$=\frac{6+2\sqrt{5}}{4}+\frac{6\sqrt{2}+6}{2}$$

$$=\frac{6+2\sqrt{5}}{4}+\frac{12\sqrt{2}+12}{4}=\frac{18+12\sqrt{2}+2\sqrt{5}}{4}$$

$$=\frac{2\left(9+6\sqrt{2}+\sqrt{5}\right)}{4}=\frac{9+6\sqrt{2}+\sqrt{5}}{2}$$

5) $\dfrac{4}{\sqrt{7}-\sqrt{5}}+\dfrac{1}{\sqrt{6}-\sqrt{7}}+\dfrac{6}{\sqrt{7}-5}$

$$=\frac{4\left(\sqrt{7}+\sqrt{5}\right)}{\left(\sqrt{7}-\sqrt{5}\right)\left(\sqrt{7}+\sqrt{5}\right)}+\frac{1\left(\sqrt{6}+\sqrt{7}\right)}{\left(\sqrt{6}-\sqrt{7}\right)\left(\sqrt{6}+\sqrt{7}\right)}+\frac{6\left(\sqrt{7}+5\right)}{\left(\sqrt{7}-5\right)\left(\sqrt{7}+5\right)}$$

$$=\frac{4\left(\sqrt{7}+\sqrt{5}\right)}{2}+\frac{\sqrt{6}+\sqrt{7}}{-1}+\frac{6\left(\sqrt{7}+5\right)}{-18}$$

$$=2\left(\sqrt{7}+\sqrt{5}\right)-\left(\sqrt{6}+\sqrt{7}\right)-\frac{\sqrt{7}+5}{3}$$

$$=2\sqrt{7}+2\sqrt{5}-\sqrt{6}-\sqrt{7}-\tfrac{1}{3}\sqrt{7}-\tfrac{5}{3}$$

$$=-\tfrac{5}{3}+2\sqrt{5}-\sqrt{6}+\tfrac{2}{3}\sqrt{7}$$

6) $\dfrac{1}{\sqrt{3}-\sqrt{2}} - \dfrac{7}{3-\sqrt{2}} + \dfrac{5}{2-\sqrt{3}}$

$$= \frac{1\left(\sqrt{3}+\sqrt{2}\right)}{\left(\sqrt{3}-\sqrt{2}\right)\left(\sqrt{3}+\sqrt{2}\right)} - \frac{7\left(3+\sqrt{2}\right)}{\left(3-\sqrt{2}\right)\left(3+\sqrt{2}\right)} + \frac{5\left(2+\sqrt{3}\right)}{\left(2-\sqrt{3}\right)\left(2+\sqrt{3}\right)}$$

$$= \frac{\sqrt{3}+\sqrt{2}}{1} - \frac{7\left(3+\sqrt{2}\right)}{7} + \frac{5\left(2+\sqrt{3}\right)}{1}$$

$$= \sqrt{3}+\sqrt{2}-3-\sqrt{2}+10+5\sqrt{3}$$

$$= 7+6\sqrt{3}$$