Q1. Prove that :

(i) $\frac{1}{2+\sqrt{3}}+\frac{2}{\sqrt{5}-\sqrt{3}}+\frac{1}{2-\sqrt{5}}=0$ (ii) $\frac{2\sqrt{6}}{\sqrt{2}+\sqrt{3}}+\frac{6\sqrt{2}}{\sqrt{6}+\sqrt{3}}-\frac{8\sqrt{3}}{\sqrt{6}+\sqrt{2}}=0$

(iii) $\frac{1}{3-\sqrt{8}}-\frac{1}{\sqrt{8}-\sqrt{7}}+\frac{1}{\sqrt{7}-\sqrt{6}}-\frac{1}{\sqrt{6}-\sqrt{5}}+\frac{1}{\sqrt{5}-2}=5$

(iv) $\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}+\frac{1}{\sqrt{4}+\sqrt{5}}+\frac{1}{\sqrt{5}+\sqrt{6}}+\frac{1}{\sqrt{6}+\sqrt{7}}+\frac{1}{\sqrt{7}+\sqrt{8}}+\frac{1}{\sqrt{8}+\sqrt{9}}=2$

Q2. If $x = 2+\sqrt{3}$, find the value of $x+\frac{1}{x}$.

Q3. If $x = 3+\sqrt{8}$, find the value of $x+\frac{1}{x}$.

Q4. If $x = \sqrt{5}+2$, find the value of $x-\frac{1}{x}$.

Q5. If $x = \sqrt{10}+3$, find the value of $x-\frac{1}{x}$.

Q6. If $x = 2+\sqrt{3}$, find the value of $x^2+\frac{1}{x^2}$.

Q7. If $x = 3-\sqrt{8}$, find the value of $x^2+\frac{1}{x^2}$.