1. $f(x)=5\sqrt{13-3x}-10$

   D_f : $13-3x\geq 0 \rightarrow 13\geq 3x \quad |:3$

   $\rightarrow x\leq \frac{13}{3} \rightarrow \underline{\underline{D_f=\{x\mid x\leq \frac{13}{3};x\in R\}}}$

   Nullstellen: $5\sqrt{13-3x}-10=0 \rightarrow 5\sqrt{13-3x}=10 \quad |:5 \rightarrow \sqrt{13-3x}=2 \quad |$Quadrieren

   $\rightarrow 13-3x=4 \rightarrow x=3$

   Probe: $5\sqrt{13-9}-10=0$ wahre Aussage

   → **Nullstelle** $\underline{\underline{x_0=3}}$

2. $f(x)=3\sqrt{x+1}-\sqrt{9x-2}-1$

   D_f : $x\geq -1$ und $x\geq \frac{2}{9} \rightarrow D_f=\{x\mid x\geq \frac{2}{9};x\in R\}$

   Nullstellen: $3\sqrt{x+1}-\sqrt{9x-2}-1=0 \rightarrow 3\sqrt{x+1}=\sqrt{9x-2}+1 \quad |$Quadrieren

   $\rightarrow 9(x+1)=9x-2+2\sqrt{9x-2}+1 \rightarrow 9x+9=9x-1+2\sqrt{9x-2} \quad |-9x+1$

   $\rightarrow 10=2\sqrt{9x-2} \quad |:2 \rightarrow 5=\sqrt{9x-2} \quad |$Quadrieren

   $\rightarrow 25=9x-2 \rightarrow x=3$

   Probe : $3\sqrt{3+1}-\sqrt{27-2}-1=0$ wahre Aussage

   → **Nullstelle** $\underline{\underline{x_0=3}}$

3. $f(x)=\sqrt{x-3}+\sqrt{x+3}-\sqrt{2x}$

   D_f : $x\geq 3$ und $x\geq -3$ und $x\geq 0 \rightarrow \underline{\underline{D_f=\{x\mid x\geq 3;x\in R\}}}$

   Nullstellen: $\rightarrow \sqrt{x-3}+\sqrt{x+3}-\sqrt{2x}=0 \quad |+\sqrt{2x} \rightarrow \sqrt{x-3}+\sqrt{x+3}=\sqrt{2x} \quad |$Quadrieren

   $\rightarrow x-3+2\sqrt{(x-3)(x+3)}+x+3=2x \quad |-2x$

   $\rightarrow 2\sqrt{x^2-9}=0 \quad |$Quadrieren $\rightarrow x^2=9$

   $\rightarrow x_1=3 \qquad [x_2=-3]$ entfällt, da $-3\notin D_f$

   Probe: $\sqrt{3-3}+\sqrt{3+3}-\sqrt{6}=0$ wahre Aussage

   → **Nullstelle** $\underline{\underline{x_0=3}}$

4. $f(x)=\sqrt{6x+13}+\sqrt{9x-2}-\sqrt{50x-19}$

   D_f : $\underline{\underline{D_f=\{x\mid x\geq \frac{19}{50};x\in R\}}}$

   Nullstellen: $\sqrt{6x+13}+\sqrt{9x-2}-\sqrt{50x-19}=0 \quad |+\sqrt{50x-19}$

   $\sqrt{6x+13}+\sqrt{9x-2}=\sqrt{50x-19} \quad |\text{Quadrieren}$

   $6x+13+2\sqrt{(6x+13)(9x-2)}+9x-2=50x-19 \quad |-15x-11$

   $2\sqrt{(6x+13)(9x-2)}=35x-30 \quad |\text{Quadrieren}$

   $4(6x+13)(9x-2)=1225x^2-2100x+900$

   $216x^2-48x+468x-104=1225x^2-2100x+900 \quad |-216x^2-420x+104$

   $1009x^2-2520x+1004=0 \quad |:1009$

   $x^2-\frac{2520}{1009}x+\frac{1004}{1009}=0$

   $x_{1,2}=\frac{1260}{1009}\pm\sqrt{\frac{1587600}{1009^2}-\frac{1013036}{1009^2}}$

   $x_{1,2}=\frac{1260}{1009}\pm\sqrt{\frac{574564}{1009^2}} \rightarrow x_{1,2}=\frac{1260}{1009}\pm\frac{758}{1009} \rightarrow \underline{x_1=\frac{2018}{1009}=2} \quad x_2=\frac{502}{1009}\approx 0{,}4975$

   Nullstelle: $\underline{\underline{x_0=2}}$ ($x_0\approx 0{,}4975$ entfällt, da Scheinlösung)

5. $f(x)=\sqrt{9+4x}+\sqrt{4-x}-\sqrt{6x+1}$

   D_f : $\underline{\underline{D_f=\{x\mid -\frac{1}{6}\leq x\leq 4;x\in R\}}}$

   Nullstelle: $\underline{\underline{x_0=4}}$ ($x_0=0$ entfällt, da Scheinlösung)

6. $f(x)=\sqrt{x-10}-\sqrt{x-2}-\sqrt{x-7}+\sqrt{x+5}$

   D_f : $\underline{\underline{D_f=\{x\mid 10\leq x;x\in R\}}}$

   Nullstelle: $\underline{\underline{x_0=11}}$