UVEDBA NOVE NEZNANKE (reši enačbo z uvedbo nove neznanke)

1. $2(x+\frac{3}{x})^2-7(x+\frac{3}{x})-4=0$ v enačbi nadomestiš z oznako $u=x+\frac{1}{x}$

$2u^2-7u-4=0$ rešim novo enačbo

$D=b^2-4ac=49-4\cdot 2\cdot(-4)=81$

$u_1=4 \quad u_2=-\frac{1}{2}$

a) $u_1=4=x+\frac{1}{x}$

$4x=x^2+1$

$x^2-4x+1=0$

$D=16-4=12$

$x_1=\frac{4+\sqrt{12}}{2}$

$x_2=\frac{4-\sqrt{12}}{2}$

b) $u_2=-\frac{1}{2}=x+\frac{1}{x}$

$-x=2x^2+2$

$2x^2+x+2=0$

$D=1-16=-15$

2. $(2x^2+x)^2-5(2x^2+x)-6=0$ nadomestiš z $u=2x^2+x$

$u^2-5u-6=0$

$(u-6)(u+1)=0$

$u=6, u=-1$

$u=6=2x^2+x$

$2x^2+x-6=0$

$D=1-4\cdot 2\cdot(-6)=49$

$x_1=1{,}5$

$x_2=-2$

$u=-1=2x^2+x$

$2x^2+x+1=0$

$D=1-4\cdot 2\cdot 1=-7$

3. $2(x+\frac{2}{x})^2-7(x+\frac{2}{x})+3=0$ (x=1, x=2)

4. $2(\frac{x^2+2}{2x})^2+3(\frac{x^2+2}{2x})=5$ (x=1, x=2)

5. $\frac{\log_2 x+4}{\log_2 x-1}=2$ (namig: neznanka $u=\log_2 x$) (x=64)

6. $\log^2 x-7\log x+10=0$ (namig: neznanka $u=\log x$) (x=100, x=100000)

7. $\frac{14-\log x^3}{\log x^2}=2$ (namig: preoblikuješ v $\frac{14-3\log x}{2\log x}=2$ in $u=\log x$) (x=100)

8. $\frac{1+5\log x}{\log x}=\log x^5$ (x=100, x=0,1)

9. $5^{2\log x}+2\cdot 5^{2\log x+1}-3\cdot 5^{2\log x-1}=1300$ ($x=10^{\frac{3}{2}}$)

10. $4^x=2^x+12$ (namig: $4^x=2^{2x}$ in $u=2^x$) (x=2)

11. $\frac{2^x+2}{2^x-1}-\frac{2^x}{2^x-3}+2=0$ (x=2)

12. $9^x=25\cdot 3^x+54$ (x=3)

13. $5^{2x-3}=2\cdot 5^{x-2}+3$ (x=2)