4.11 Notes – Solve Rational Equations – Day 2

Solve each equation. Remember to check for extraneous solutions.

1) $\left(\frac{k+4}{4}+\frac{k-1}{4}=\frac{k+4}{4k}\right)4k$ $k\neq 0$

$k(k+4)+k(k-1)=k+4$

$k^2+4k+k^2-k=k+4$

$2k^2+2k-4=0$ $\div 2$

$k^2+k-2=0$

$(k+2)(k-1)=0$

$k=-2,1$

2) $\left(\frac{1}{2m^2}=\frac{1}{m}-\frac{1}{2}\right)2m^2$ $m\neq 0$

$1=2m-m^2$

$m^2-2m+1=0$

$(m-1)(m-1)=0$

$m=1$

3) $\left(\frac{n^2-n-6}{n^2}-\frac{2n+12}{n}=\frac{n-6}{2n}\right)2n^2$ $n\neq 0$

$2(n^2-n-6)-2n(2n+12)=n(n-6)$

$2n^2-2n-12-4n^2-24n=n^2-6n$

$-3n^2-20n-12=0$

$3n^2+20n+12=0$

$(3n+2)(n+6)=0$

$n=-\frac{2}{3},-6$

4) $\left(\frac{3x^2+24x+48}{x^2}+\frac{x-6}{2x^2}=\frac{1}{x^2}\right)2x^2$ $x\neq 0$

$2(3x^2+24x+48)+x-6=2$

$6x^2+48x+96+x-6=2$

$6x^2+49x+88=0$

$(3x+8)(2x+11)=0$

$x=-\frac{8}{3},\frac{-11}{2}$

5) $\left(\frac{k^2+2k-8}{3k^3}=\frac{1}{3k^2}+\frac{1}{k^2}\right)3k^3$ $k\neq 0$

$k^2+2k-8=k+3k$

$k^2-2k-8=0$

$(k-4)(k+2)=0$

$k=4,-2$

6) $\left(\frac{k}{3}-\frac{1}{3k}=\frac{1}{k}\right)3k$ $k\neq 0$

$k^2-1=3$

$k^2=4$

$k=\pm 2$

7) $\left(\frac{x-4}{6x}+\frac{x^2-3x-10}{6x}=\frac{x-1}{6}\right)6x$ $x\neq 0$

$x-4+x^2-3x-10=x(x-1)$

$x-4+x^2-3x-10=x^2-x$

$-1x-14=0$

$-1x=14$

$x=-14$

8) $\left(\frac{1}{x^2}=\frac{x-1}{x}+\frac{1}{x}\right)x^2$

$1=x^2-x+x$

$1=x^2$

$x=\pm 1$ $x\neq 0$