Löse folgende Gleichungen.

Berechne zur Kontrolle jeweils die Probe.

1.

$$\frac{5}{4}-\frac{5x-17}{6x}=\frac{8}{3x}+\frac{7x+12}{15x}+\frac{5}{2}\bullet\left(\frac{3}{x}-\frac{5}{6}\right)$$

$$\frac{5}{4}-\frac{5x-17}{6x}=\frac{8}{3x}+\frac{7x+12}{15x}+\frac{15}{2x}-\frac{25}{12}\mid *360x$$

$$\frac{360x*5}{4}-\frac{360x*(5x-17)}{6x}=\frac{360x*8}{3x}+\frac{360x*(7x+12)}{15x}+\frac{360x*15}{2x}-\frac{360x*25}{12}$$

$$450x-60*(5x-17)=120*8+24*(7x+12)+2700-750x$$

$$450x-300x+1020=960+168x+288+2700-750x$$

$$150x+1020=3948-582x\mid +582x$$

$$732x+1020=3948\mid -1020$$

$$732x=2928\mid :732$$

$$x=4$$

$$P:$$

$$1{,}125=1{,}125$$

2.

$$\frac{x}{4}+1=4\bullet\left(\frac{x}{4}-10\right)-\frac{5x+4}{6}$$

$$\frac{x}{4}+1=x-40-\frac{5x+4}{6}\mid *6$$

$$1{,}5x+6=6x-240-5x-4$$

$$1{,}5x+6=x-244\mid -x$$

$$0{,}5x+6=-244\mid -6$$

$$0{,}5x=-250\mid :0{,}5$$

$$x=-500$$

$$P:$$

$$-124=-124$$

3.

$$\frac{7}{2x}-0{,}25\bullet(\frac{4}{x}-14)=\frac{6+x}{x}-\frac{2-6x}{4x}$$

$$\frac{7}{2x}-\frac{1}{x}+3{,}5=\frac{6+x}{x}-\frac{2-6x}{4x}\mid *4x$$

$$\frac{4x*7}{2x}-\frac{4x*1}{x}+4x*3{,}5=\frac{4x*(6+x)}{x}-\frac{4x*(2-6x)}{4x}$$

$$14-4+14x=24+4x-2+6x$$

$$10+14x=22+10x\mid -10x$$

$$10+4x=22\mid -10$$

$$4x=12\mid :4$$

$$x=3$$

$$P:$$

$$4{,}33=4{,}33$$

$$10\frac{3}{5}-3(\frac{3}{x}-5)-12=\frac{5}{x}+8\frac{2}{5}:\frac{2}{3}-\frac{4}{2x}$$

$$10{,}6-\frac{9}{x}+15-12=\frac{5}{x}+12{,}6-\frac{2}{x}\,|*x$$

$$10{,}6x-9+15x-12x=5+12{,}6x-2$$

4. $$13{,}6x-9=3+12{,}6x\,|-12{,}6x$$

$$x-9=3\,|+9$$

$$x=12$$

$$P:$$

$$12{,}85=12{,}85$$

$$\frac{17}{2x}+52\frac{1}{2}-\frac{2}{3}\bullet(\frac{8}{x}-\frac{7{,}5}{6})=\frac{13}{x}-3{,}5$$

$$\frac{17}{2x}+52{,}5-\frac{16}{3x}+\frac{15}{18}=\frac{13}{x}-3{,}5\,|*x$$

$$8{,}5+52{,}5x-\frac{16}{3}+\frac{15}{18}x=13-3{,}5x$$

$$\frac{19}{6}+\frac{160}{3}x=13-3{,}5x\,|+3{,}5x$$

5. $$\frac{19}{6}+\frac{341}{6}x=13\,|-\frac{19}{6}$$

$$\frac{341}{6}x=\frac{59}{6}\,|:\frac{341}{6}$$

$$x=\frac{59}{341}\approx 0{,}173$$

$$P:$$

$$71{,}64=71{,}64$$

$$\frac{2x+3}{3}-\frac{3x+8}{4}=\frac{5}{6}-2\bullet(x-1)+11\frac{1}{2}$$

$$\frac{2x+3}{3}-\frac{3x+8}{4}=\frac{5}{6}-2x+2+11\frac{1}{2}$$

$$\frac{2x+3}{3}-\frac{3x+8}{4}=\frac{5}{6}-2x+13\frac{1}{2}\,|*12$$

$$8x+12-9x-24=10-24x+162$$

$$-x-12=-24x+172\,|+24x$$

6. $$23x-12=172\,|+12$$

$$23x=184$$

$$x=8$$

$$P:$$

$$-\frac{5}{3}=-\frac{5}{3}$$

$(1{,}2x+1{,}5)\bullet 0{,}7-(0{,}3-1{,}7x)\bullet 1{,}2=(21{,}38-4{,}24x)\bullet 0{,}5$

$0{,}84x+1{,}05-0{,}36+2{,}04x=10{,}69-2{,}12x$

$2{,}88x+0{,}69=10{,}69-2{,}12x\,|+2{,}12x$

7. $5x+0{,}69=10{,}69\,|-0{,}69$

$5x=10\,|:5$

$x=2$

P:

$6{,}45=6{,}45$

$2\frac{1}{3}(5x-8)-\frac{x+3}{2}=1\frac{1}{2}+\frac{1}{3}x$

$\frac{35}{3}x-\frac{56}{3}-\frac{x+3}{2}=1\frac{1}{2}+\frac{1}{3}x\,|*2$

$\frac{70}{3}x-\frac{112}{3}-x-3=3+\frac{2}{3}x$

$\frac{67}{3}x-\frac{121}{3}=3+\frac{2}{3}x\,|-\frac{2}{3}x$

8. $\frac{65}{3}x-\frac{121}{3}=3\,|+\frac{121}{3}$

$\frac{65}{3}x=\frac{130}{3}\,|:\frac{65}{3}$

$x=2$

P:

$\frac{13}{6}=\frac{13}{6}$

$4(4{,}7x-14{,}7)-16\frac{1{,}075x+1{,}375}{2}=43{,}3-(37{,}5-2{,}5x)\bullet 1{,}8$

$18{,}8x-58{,}8-8{,}6x-11=43{,}3-67{,}5+4{,}5x$

$10{,}2x-69{,}8=-24{,}2+4{,}5x\,|-4{,}5x$

9. $5{,}7x-69{,}8=-24{,}2\,|+69{,}8$

$5{,}7x=45{,}6$

$x=8$

P:

$11{,}8=11{,}8$

$1{,}5-3\bullet(3x-2\frac{7}{12})=\frac{2}{3}\bullet(4\frac{1}{8}x-3{,}5)-\frac{x}{6}$

$1{,}5-9x+7{,}75=2{,}75x-\frac{7}{3}-\frac{x}{6}$

$9{,}25-9x=2{,}75x-\frac{7}{3}-\frac{x}{6}\,|*6$

$55{,}5-54x=16{,}5x-14-x\,|+54x$

10. $55{,}5=69{,}5x-14\,|+14$

$69{,}5=69{,}5x\,|:69{,}5$

$x=1$

P:

$0{,}25=0{,}25$

Quelle: z.T. alte Qualiaufgaben