

$$\frac{(2x+1)(4x-3)}{4x-3} = \frac{3(4x-3)}{4x-3}$$

$$\begin{array}{r} 2x+1 = 12x-9 \\ -2x+1 \quad -2x+9 \\ \hline 10 = 10x \end{array}$$

$$10 = 10x$$

$$1 = x$$

lost root

$$4x-3=0$$

$$\frac{4}{4}x = \frac{3}{4}$$

$$x = 1, \frac{3}{4}$$

$$23) \quad \frac{2w(4w-1)}{w} = \frac{w(1-4w)}{w}$$

$$\begin{array}{r} 8w-2 = 1-4w \\ 4w+2 \quad +3+4w \\ \hline 12w = 3 \end{array}$$

$$\frac{12w}{12} = \frac{3}{12}$$

$$w = \frac{1}{4}, 0$$

lost root  
 $w=0$

$$24) \quad 3(2x-3)^2 = 4x(3-2x)$$

$$\frac{3(2x-3)^2}{2x-3} = \frac{-4x(2x-3)}{2x-3}$$

$$\begin{array}{r} 6x-9 = -4x \\ -6x \quad -6x \\ \hline -9 = -10x \end{array}$$

$$\frac{-9}{-10} = \frac{-10x}{-10}$$

$$\frac{9}{10} = x$$

lost root

$$2x-3=0$$

$$\frac{2}{2}x = \frac{3}{2}$$

$$x = \frac{9}{10}, \frac{3}{2}$$

$$25) \frac{(x+3)(x-3)}{x+3} + \frac{(x-3)}{x+3} = \frac{18-6x}{x^2-9}$$

$$(x+3)(x-3)$$

$$(x+3)^2 + (x-3)^2 = 18-6x$$

$$x^2 + 6x + 9 + x^2 - 6x + 9 = 18 - 6x$$

$$2x^2 + 18 = 18 - 6x$$

Gained  
a root

$$2x^2 + 6x + 18 = 0$$

$$2x(x+3)$$

$$x^2 + 3x + 9 = 0$$

$$x = 0, -3$$

$$26) \frac{(r+1)(r-1)}{r+1} - \frac{(r-1)(r-1)}{r+1} = \frac{2}{r^2-1}$$

$$(r+1)(r-1)$$

$$r^2 + r - r^2 + r = 2$$

$$2r = 2$$

$$r = 1$$

Gained a root  
no solution

$$27) \frac{3(x+2)}{x^2+1} = \frac{x}{3} + \frac{5}{x+2}, \quad 3(x+2)$$

$$3x^2 + 3 = x^2 + 2x + 15$$

Gained  
a root

$$2x^2 - 2x - 12 = 0$$

$$2(x^2 - x - 6) = 0$$

$$(x-3)(x+2)$$

$$x = 3, -2$$

$$\boxed{x=3}$$

gained root

$$\begin{aligned}
 & \cancel{x} \cdot 16 = x \\
 & (x-4)(x-16) \\
 & x^2 - 20x + 64 = 0
 \end{aligned}$$

$$4x = x^2 - 16x + 64$$

$$(2\sqrt{x})^2 = (x-8)^2 \quad (29)$$

$$x = \frac{14}{3}$$

$$14 = \frac{3}{x}$$

$$1 = \frac{3x-13}{x+13}$$

$$1 = 3x - 9 - 4$$

$$1 = 3(x-3) - 4$$

$$\frac{x+2}{x+2}$$

$$x+2 = \frac{3(x-3)(x+2) - 4(x+2)}{x+2}$$

$$\cancel{(x+2)}(x-3)$$

$$x^2 - 3x - 6$$

$$\frac{x+2}{\cancel{(x+2)}(x-3)}$$

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

$$\frac{(x-3)(x+2)}{(x+2)(x-3)}$$

gained root

$$\begin{aligned}
 & \cancel{x} \cdot 2 = x \\
 & x^2 - 4 = 0
 \end{aligned}$$

$$2x+5 = x^2+2x+1$$

$$\textcircled{30} \quad \sqrt{2x+5} = x+1$$

lost root

gained root

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$$(37) \quad \sqrt{2}x^2 - 5x + \sqrt{8} = 0$$

$$a = \sqrt{2}$$

$$b = -5$$

$$c = \sqrt{8}$$

$$\frac{5 \pm \sqrt{(-5)^2 - 4(\sqrt{2})(\sqrt{8})}}{2(\sqrt{2})}$$

$$\frac{5 \pm \sqrt{25 - 4(16)}}{2\sqrt{2}}$$

$$\frac{5 \pm \sqrt{25 - 16}}{2\sqrt{2}}$$

$$\frac{5 \pm 3}{2\sqrt{2}} = \frac{\cancel{8}^4}{\cancel{2}\sqrt{2}} \quad \frac{\cancel{2}\sqrt{2}}{\cancel{2}\sqrt{2}\sqrt{2}} \quad \boxed{\sqrt{2}, \frac{\sqrt{2}}{2}}$$

$$38) \quad 4x^2 - 2\sqrt{5}x - 1 = 0$$

$$a = 4$$

$$b = -2\sqrt{5}$$

$$c = -1$$

$$\frac{2\sqrt{5} \pm \sqrt{(-2\sqrt{5})^2 - 4(4)(-1)}}{2(4)}$$

$$\frac{2\sqrt{5} \pm \sqrt{20 + 16}}{8}$$

$$\frac{2\sqrt{5} \pm \sqrt{36}}{8}$$

$$\frac{2\sqrt{5} \pm 6}{8}$$

$$\frac{\phantom{2\sqrt{5} \pm 6}}{4}$$

$$\boxed{\frac{\sqrt{5} \pm 3}{4}}$$