

Solve each rational equation.

1. $\frac{3}{x+2} + \frac{38}{x^2-4x-12} = \frac{x}{x-6}$

2. $\frac{2x}{x^2-1} = \frac{4}{x^2+2x-3}$

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$$\frac{\cancel{x-6}}{\cancel{x-6}} \cdot \frac{3}{x+2} + \frac{38}{(x-6)(x+2)} = \frac{x}{x-6} \cdot \frac{x+2}{x+2}$$

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

$$\frac{3x-18}{(x-6)\cancel{(x+2)}} + \frac{38}{(x-6)\cancel{(x+2)}} = \frac{x^2+2x}{(x-6)\cancel{(x+2)}}$$

$$\frac{2x^2+6x}{(x+3)\cancel{(x+1)}\cancel{(x-1)}} = \frac{4x+4}{(x+3)\cancel{(x+1)}\cancel{(x-1)}}$$

$$3x-18+38 = x^2+2x$$

$$2x^2+6x = 4x+4$$

$$3x+20 = x^2+2x$$

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

$$0 = x^2-x-20$$

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

$$0 = (x-5)(x+4)$$

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

$$x = -4, 5$$

$$x = -2, 1$$

extraneous sol