

4.22  
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$$\sqrt{x+1} - \sqrt{9-x} = \sqrt{2x-12}$$

$$\sqrt{x+1} = \sqrt{2x-12} + \sqrt{9-x}$$

$$x+1 = \cancel{2x-12} + 2\sqrt{(2x-12)(9-x)} + \cancel{9-x}$$

$$2 = \sqrt{-2x^2 + 30x - 108}$$

$$4 = -2x^2 + 30x - 108$$

$$x^2 - 15x + 56 = 0$$

$$\boxed{\begin{array}{l} x = \cancel{7} \\ x = 8 \end{array}}$$

$$\boxed{6 < x < 9} \leftarrow \begin{array}{l} x+1 \geq 0 \\ 9-x \geq 0 \\ \sqrt{2x-12} \geq 0 \end{array}$$