

$$\begin{array}{l}
1) \quad \sqrt{3x-2} = \sqrt{x+6} \quad | \text{ square both sides} \\
\quad \quad 3x-2 = x+6 \quad | -x+2 \\
\quad \quad 2x = 8 \\
\quad \quad x = 4
\end{array}$$

$$\text{Check: } \sqrt{12-2} = \sqrt{4+6} \quad \checkmark$$

$$L = \{4\}$$

$$\begin{array}{l}
2) \quad 3 + \sqrt{4z^2 + 3} = 2z \quad | -3 \text{ (in order to isolate the radical)} \\
\quad \quad \sqrt{4z^2 + 3} = 2z - 3 \quad | \text{ square both sides} \\
\quad \quad 4z^2 + 3 = (2z - 3)^2 \\
\quad \quad 4z^2 + 3 = 4z^2 - 12z + 9 \quad | -4z^2 \\
\quad \quad \quad 3 = -12z + 9 \quad | +12z - 3 \\
\quad \quad \quad 12z = 6 \quad | \div 12 \\
\quad \quad \quad z = 0.5
\end{array}$$

$$\text{Check: } 3 + \sqrt{4 \cdot 0.25 + 3} = 2 \cdot 0.5$$

$$3 + \sqrt{4} = 1 \text{ false, hence } z = 0.5 \text{ not a valid solution.}$$

$$L = \{\}$$