Practice Run

Let's try some *Practice Runs*:

For the following questions:

- state the restriction(s) on the variable,
- solve the equation, and
- verify the solution.

Please show all necessary steps in finding the solution.

1. $\sqrt{26x} = 78$

2. $6\sqrt{5x} + 52 = 82$

3. $\frac{1}{2}\sqrt{10x - 20} = 55$

Compare your answers.

For the following questions:

- state the restriction(s) on the variable,
- solve the equation, and
- verify the solution.

Please show all necessary steps in finding the solution.

1. $\sqrt{26x} = 78$

$$\begin{aligned} 26x &\geq 0 \\ \frac{26}{26}x &\geq \frac{0}{26} \\ x &\geq 0,\ x \in \mathrm{R} \end{aligned}$$

$$\begin{aligned} \sqrt{26x} &= 78 \\ \left(\sqrt{26x}\right)^2 &= (78)^2 \\ 26x &= 6084 \\ \frac{26}{26}x &= \frac{6084}{26} \\ x &= 234 \end{aligned}$$

$\sqrt{26x}$	78
$\sqrt{26x}$ $= \sqrt{26(234)}$ $= \sqrt{6084}$ $= 78$	78 78

Left side = Right Side

$x = 234$

2. $6\sqrt{5x} + 52 = 82$

$$
\begin{aligned}
5x &\geq 0 \\
\frac{5}{5}x &\geq \frac{0}{5} \\
x &\geq 0, x \in \mathrm{R}
\end{aligned}
$$

$$
\begin{aligned}
6\sqrt{5x} + 52 &= 82 \\
6\sqrt{5x} + 52 - 52 &= 82 - 52 \\
6\sqrt{5x} &= 30 \\
\frac{6\sqrt{5x}}{6} &= \frac{30}{6} \\
\sqrt{5x} &= 5 \\
(\sqrt{5x})^2 &= (5)^2 \\
5x &= 25 \\
\frac{5}{5}x &= \frac{25}{5} \\
x &= 5
\end{aligned}
$$

$6\sqrt{5x} + 52$	82
$6\sqrt{5x} + 52$	82
$= 6\sqrt{5(5)} + 52$	
$= 6\sqrt{25} + 52$	
$= 30 + 52$	
$= 82$	82

Left side = Right Side

$x = 5$

3. $\frac{1}{2}\sqrt{10x - 20} = 55$

$$
\begin{aligned}
10x - 20 &\geq 0 \\
10x - 20 + 20 &\geq 0 + 20 \\
\frac{10}{10}x &\geq \frac{20}{10} \\
x &\geq 2, x \in \mathrm{R}
\end{aligned}
$$

$$
\begin{aligned}
\frac{1}{2}\sqrt{10x - 20} &= 55 \\
2 \bullet \frac{1}{2}\sqrt{10x - 20} &= 55 \bullet 2 \\
\sqrt{10x - 20} &= 110 \\
(\sqrt{10x - 20})^2 &= (110)^2 \\
10x - 20 &= 12100 \\
10x - 20 + 20 &= 12100 + 20 \\
10x &= 12120 \\
\frac{10}{10}x &= \frac{12120}{10} \\
x &= 1212
\end{aligned}
$$

$\frac{1}{2}\sqrt{10x - 20}$	55
$\frac{1}{2}\sqrt{10x - 20}$	55
$= \frac{1}{2}\sqrt{10(1212) - 20}$	
$= \frac{1}{2}\sqrt{12100}$	
$= \frac{1}{2} \bullet 110$	
$= 55$	55

Left side = Right Side

$x = 1212$