Advanced Algebra w/ Trig
6.6 Solving Radical Equations
$(3 \sqrt{2} x)^{2}=4^{2}$

Solve the following radical equations for $x$. Be sure to check for extraneous solutions!

(1.) $(\sqrt{2 x})^{8}=4^{3}$

$$
\frac{2 x}{2}=\frac{64}{2}
$$

$$
x=32
$$

check:

$$
\begin{aligned}
\sqrt[3]{2(32)} & \stackrel{?}{=} 4 \\
\sqrt[3]{64} & =4 \\
4 & =4
\end{aligned}
$$

$$
\text { (3. }(\sqrt[3]{3 x-6})^{3}=3^{3}
$$

$$
\begin{array}{rr}
\begin{array}{r}
3 x-6
\end{array}=27 \\
+6+6
\end{array} \quad \begin{aligned}
\frac{\text { check }}{3}=\frac{33}{3} \\
x=11
\end{aligned} \quad \begin{aligned}
& \sqrt[3]{33-6} \stackrel{?}{=} 3 \\
& \begin{array}{l}
27 \\
=3 \\
3
\end{array} \\
& =3 \sqrt{=} 3
\end{aligned}
$$

$\sqrt[4]{2 \times-4}$

$$
\begin{array}{rl}
5 \cdot\left((2 x-4)^{\frac{1}{4}}\right)^{4}=(-2)^{4} & \\
2 x-4 & =16 \\
2 x & \text { check: } \\
\text { (2(10) }-4)^{1 / 4} & ? \\
=-18 & 16^{1 / 4}
\end{array}=-2
$$

2. $(\sqrt{x+1})^{2}=(\sqrt{2 x-7})^{2}$

$$
\begin{array}{r}
\begin{array}{r}
x+1= \\
-x x-7 \\
-x
\end{array} \\
\hline 1=x-7 \\
+7+7 \\
8=x
\end{array}
$$

check
$\begin{aligned} \sqrt{8+1} & \stackrel{?}{=} \sqrt{2(8)-7} \\ \sqrt{9} & \stackrel{y}{=} \sqrt{9}\end{aligned}$
4. $2+\sqrt{3 x+7}=6 \quad 3=3 \mathrm{~J}$

$$
\begin{array}{r}
\frac{-2}{(\sqrt{3 x+7})^{2}=4^{2}} \\
3 x+7=16 \\
3 x=9 \\
x=3
\end{array}
$$

6. $4-(1-7 x)^{\frac{1}{3}}=0$

$$
\begin{aligned}
& \frac{-4}{\frac{-(1-7 x)^{1 / 3}}{-1}}=\frac{-4}{-1} \\
& {\left[(1-7 x)^{1 / 33}\right]^{3}=4^{3}} \\
& 1-7 x=64 \\
& -1 \\
& -7 x=63 \\
& x=-9
\end{aligned}
$$

Name:
$(\sqrt{2 x-7})^{2}$

$$
x=-9
$$

$$
\begin{aligned}
& \frac{\text { Check }}{4-(1-7(-9))^{1 / 3}} \stackrel{?}{=} 0 \\
& 4-(64)^{1 / 3}=0 \\
& 4-4=0
\end{aligned}
$$

7. $\sqrt{3 x-2}=\sqrt{x-4}$
8. $\sqrt{3 x+2}=5 \sqrt{x-7}$
9. $\sqrt{x-1}=4 \sqrt{x+1}$
10. $\sqrt{x-4}-1=5$
$\square$
