Like radicals are terms with the same radicand and index number.
Only like radicals can be combined.
Note: Radicals may have to be simplified to identify like radicals

Ex. Simplify
a) $2 \sqrt{14}+8 \sqrt{14}-3 \sqrt{14}=7 \sqrt{14}$
b)

$$
\begin{aligned}
& \sqrt{48}-\sqrt{3} \\
& 4 \sqrt{3}-\sqrt{3}=3 \sqrt{3}
\end{aligned}
$$

C)

$$
\begin{aligned}
& 2 \sqrt{12}+3 \sqrt{50}-2 \sqrt{75}-6 \sqrt{32} \\
& 2(2 \sqrt{3})+3(5 \sqrt{2})-2(5 \sqrt{3})-6(4 \sqrt{2}) \\
& 4 \sqrt{3}+15 \sqrt{2}-10 \sqrt{3}-24 \sqrt{2}=-6 \sqrt{3}-9 \sqrt{2}
\end{aligned}
$$

d) $\sqrt{9 x}-2 \sqrt{16 x}$

$$
3 \sqrt{x}-2(4 \sqrt{x})=3 \sqrt{x}-8 \sqrt{x}=-5 \sqrt{x}
$$

e)

$$
\begin{aligned}
& -\frac{1}{5} \sqrt[3]{125 x}+\sqrt[3]{125 x^{4}} \\
& \frac{-1}{8}\left(\frac{6}{1} \sqrt[3]{x}\right)+5 x \sqrt[3]{x} \\
& -\sqrt[3]{x}+5 x \sqrt[3]{x}=(-1+5 x) \sqrt[3]{x}
\end{aligned}
$$

Ex. Determine the exact length of $A B$


$$
\begin{array}{rr}
\tan 45^{\circ}=\frac{\sqrt{12}}{x} & \tan 30^{\circ} \\
1=\frac{\sqrt{12}}{x} & \frac{1}{\sqrt{3}} \\
x=\frac{\sqrt{12}}{y} \\
x=2 \sqrt{3} & y=\frac{\sqrt{12}}{y} \\
& y=6 \\
& A B=2 \sqrt{3}+6
\end{array}
$$

Ex. A circle is inscribed inside a circle. The area of the circle is $54 \mathrm{~cm}^{2}$.

a) What is the radius of the circle in exact form?

$$
\begin{aligned}
& A=54 \pi \\
& \pi r^{2}=54 \pi \\
& r=\sqrt{54} \text { or } 3 \sqrt{6} \\
& \text { oath of one side of the square? }
\end{aligned} \longleftrightarrow \text { note } \begin{aligned}
& d=2 r \\
& d=2(3 \sqrt{6}) \\
& d=6 \sqrt{6}
\end{aligned}
$$

b) What is the length of one side of the square?


$$
\begin{aligned}
x^{2}+x^{2} & =(6 \sqrt{6})^{2} \\
2 x^{2} & =6 \sqrt{6} \times 6 \sqrt{6} \\
2 x^{2} & =216 \\
x^{2} & =108 \\
x & =\sqrt{108}=6 \sqrt{3}
\end{aligned}
$$

$$
\begin{aligned}
& \left\{\begin{aligned}
& \text { Alt method } \\
& 65 \% \\
& 50 \begin{array}{r}
65 \\
\sin 45
\end{array}=\frac{x}{6 \sqrt{6}} \\
& \frac{1}{\sqrt{2}}=\frac{x}{6 \sqrt{6}} \\
& \sqrt{2} x=6 \sqrt{6}
\end{aligned}\right. \\
& x=\frac{6 \sqrt{6}}{\sqrt{2}}
\end{aligned}
$$

Assignment: Adding \& Subtracting Radicals Worksheet

$$
\begin{aligned}
& x=\frac{6 \sqrt{6}}{\sqrt{2}} \\
& x=6 \sqrt{3}
\end{aligned}
$$

