Solving Quadratic Equations using Square Roots
Ex. 1 Solve the equation using two methods.

$$
x^{2}-7=9
$$

$$
\begin{aligned}
& \text { FACTORING } \\
& x^{2}-7=9 \\
& x^{2}-16=0 \\
& (x+4)(x-4)=0 \\
& x+4=0 \quad x-4=0 \\
& x=-4 \quad x=4
\end{aligned}
$$

$$
\begin{gathered}
\text { USING SQUARE ROOTS } \\
x^{2}-7=9 \\
\sqrt{x^{2}}=\sqrt{16} \\
x= \pm 4
\end{gathered}
$$

Ex. 2
Solve each equation using square roots.
a. $4 r^{2}-7=9$
b.

$$
r= \pm 2
$$

$$
\begin{aligned}
& \frac{36 x^{2}}{36}=\frac{121}{36} \\
& \sqrt{x^{2}}=\sqrt{\frac{121}{36}} \\
& x= \pm \frac{11}{6}
\end{aligned}
$$

C.

$$
\begin{aligned}
& 7 x^{2}-8=13 \\
& \frac{7 x^{2}}{7}=\frac{21}{7} \\
& \sqrt{x^{2}}=\sqrt{3} \\
& x= \pm \sqrt{3}
\end{aligned}
$$

d.

$$
\begin{aligned}
& 4 z^{2}+7=12 \\
& \frac{4 z^{2}}{4}=\frac{5}{4} \\
& \sqrt{z^{2}}=\sqrt{\frac{5}{4}} \\
& z= \pm \frac{\sqrt{5}}{2}
\end{aligned}
$$

(no rounded decimals)

A glimpse of things to come...

* $e$

$$
\begin{aligned}
& x^{2}+13=9 \\
& \sqrt{x^{2}}=\sqrt{-4} \\
& x= \pm 2 i
\end{aligned}
$$

Ex. 3 Solve using square roots.

$$
\begin{aligned}
& \text { a. }(x+2)^{2}=10 \\
& \sqrt{(x+2)^{2}}=\sqrt{10} \\
& x+2= \pm \sqrt{10} \\
& x=-2 \pm \sqrt{10}
\end{aligned}
$$

$$
\begin{aligned}
& \text { b. } \frac{2(x-3)^{2}}{2}=\frac{18}{2} \\
& \sqrt{(x-3)^{2}}=\sqrt{9} \\
& x-3= \pm 3 \\
& x=3 \pm 3 \\
& \begin{aligned}
x=3+3 \quad x=3-3 \\
x=6 \quad x=0
\end{aligned}
\end{aligned}
$$

