$$
y=a(x-p)^{2}+q
$$

Pre-Calculus 11 4.3 Part 1 Solving by completing the Square / Square Rooting
Solving by Square Rooting - use this process when the initial quadratic equation is in Vertex form.
(1) isolate the squared term

$$
\begin{aligned}
& \text { 1. } x^{2}-64=0 \\
& +64+64 \\
& \sqrt{x^{2}}=\sqrt{64} \\
& x= \pm 8
\end{aligned}
$$

(2) Square root both sides.

$$
\text { 2. } \begin{aligned}
& 2 x^{2}-18+18 \\
& \begin{array}{l}
28 \\
\hline 2 x^{2}
\end{array}=\frac{18}{2} \\
& \frac{2}{2}
\end{aligned}
$$

3. $(x+2)^{2}-6=0$

$$
\begin{aligned}
& +6+6 \\
& \begin{array}{l}
(x+2)^{2}=\sqrt{6} \\
x+x= \pm \sqrt{6} \\
-12 \\
x=-2 \pm \sqrt{6}
\end{array} \rightarrow-2+\sqrt{6}=.449 \ldots \\
& x-2-\sqrt{6}=-4.44 \ldots
\end{aligned}
$$

$$
\text { 4. } \begin{array}{r}
2(x-3)^{2}-1 / 4=0 \\
\frac{+14}{14}+14 \\
\frac{2(x-3)^{2}}{x / 2} \\
=\frac{14}{2} \\
\sqrt{(x-3)^{2}}=\sqrt{7} \\
x-\not 2= \pm \sqrt{7} \\
+/ 3 \\
x=3 \pm \sqrt{7}
\end{array}
$$

$$
3+\sqrt{7}
$$

$$
3-\sqrt{7}
$$

$$
y=a x^{2}+b x+c
$$

Solving by Completing the Square and Square Rooting - use when the quadratic equation is initially in standard form.

$$
\text { 2. }\left(-x^{2}+4 x+7=0\right) \div-1 \text { we can do this. }
$$

$i_{0}=0$ ii, whin divide mung the extine equation.

$$
\begin{aligned}
& \frac{\text { 1. }\left(x^{2}+6 x\right)-3=0}{\left(x^{2}+6 x+9-9\right)-3}=0 \\
& \begin{aligned}
&(x+3)^{2}-1 \not 2=0 \\
&+12
\end{aligned} \\
& \sqrt{(x+3)^{2}}=\sqrt{12} \\
& x+3= \pm \sqrt{12} \\
& -3 \quad-3 \\
& x=-3 \pm \sqrt{12} \\
& \left(x^{2}-4 x\right)-7=0 \\
& \left(x^{2}-4 x+4-4\right)-7=0 \\
& (x-2)^{2}-x=0 \\
& \sqrt{(x-2)^{2}}=\sqrt{11} \\
& \begin{array}{r}
x-\not 2 \\
x-2
\end{array}= \pm \sqrt{11} \\
& \begin{array}{l}
=2 \pm \sqrt{11} \\
-5=0
\end{array} \\
& \text { 3. } 2\left(\frac{\left.2 x^{2}+8 x\right)-5=0}{2\left(x^{2}+4 x+4-4\right)-5}=0\right. \\
& \begin{aligned}
& 2(x+2)^{2}-136=0 \\
&+13
\end{aligned} \\
& \frac{2(x+2)^{2}}{22}=\frac{13}{2} \\
& \sqrt{(x+2)^{2}}=\sqrt{\frac{13}{2}} \\
& \begin{array}{c}
x+24= \pm \sqrt{\frac{13}{2}} \\
-2
\end{array} \\
& x=-2 \pm \sqrt{\frac{13}{2}}
\end{aligned}
$$

