HOW TO USE THE QUADRATIC FORMULA TO DETERMINE THE ROOTS OF A QUADRATIC EQUATION.

If $a x^{2}+b x+c=0$, then $x=\frac{-b \pm \sqrt{b^{2}-4 a c}}{2 a}$

Examples:

$$
a x^{2}+b x+c=0
$$

(1) $3 x^{2}-5=2 x+4$

$$
\begin{aligned}
& a=3{ }^{b=-2} c-9 \\
& 3 x^{2}-2 x-9=0
\end{aligned}
$$

$$
\begin{aligned}
\sqrt{112} & =\sqrt{4} \cdot \sqrt{28} \\
& =\sqrt{4} \cdot \sqrt{4} \cdot \sqrt{7} \\
& =4 \sqrt{7}
\end{aligned}
$$

$$
\begin{aligned}
& x=\frac{2 \pm \sqrt{4-4(8) \cdot-9)}}{2 \cdot 3} \\
& \begin{array}{l}
=\frac{2 \pm \sqrt{4+108}}{6}=\frac{2 \pm \sqrt{122}}{6} \\
=\frac{2 \pm 4 \sqrt{7}}{6}=\frac{1(1+2 \sqrt{7}}{2+3}=\frac{1 \pm 2 \sqrt{7}}{3} \\
1+2 \sqrt{7}) \frac{1}{3} \frac{2 \sqrt{7}}{3}
\end{array} \\
& \begin{array}{l}
=\frac{2 \pm \sqrt{4+108}}{6}=\frac{2 \pm \sqrt{112}}{6} \\
=\frac{2 \pm 4 \sqrt{7}}{6}=\frac{1(1+2 \sqrt{7}}{2 \cdot 3}=\frac{122 \sqrt{7}}{3} \\
1+2 \sqrt{7}
\end{array} \\
& \frac{1}{3}+\frac{2 \sqrt{7}}{3}, \frac{1}{3}-\frac{2 \sqrt{7}}{3} \\
& =4 \sqrt{7}
\end{aligned}
$$

$$
\begin{aligned}
& \text { (2) } \\
& \begin{array}{l}
a=2 b=-1 \quad c=-1 \quad 2 x^{2}-x-6=(x+3)(x-2)=07 \\
2 x^{2}-x-6=0 \quad-106
\end{array} \\
& x=\frac{1 \pm \sqrt{1-4(2) \cdot(6)}}{4}=\frac{1 \pm \sqrt{1+48}}{4}=\frac{1 \pm \sqrt{47}}{4}\left(\frac{-3,2}{2}, 2\right) \\
& \begin{aligned}
& \frac{1 \pm 7}{4} \Rightarrow \frac{1+7}{4} \quad \frac{1-7}{4} \\
& 2, \frac{-6}{4}=\frac{-3}{2} \\
& 2,-\frac{3}{2}
\end{aligned}
\end{aligned}
$$

(3)

$$
\begin{aligned}
& 3 x^{2}-4 x-2=0 \\
& x=\frac{4 \pm \sqrt{16+24}}{6}=\frac{4 \pm \sqrt{40}}{6}=\frac{4 \pm 2 \sqrt{10}}{6} \\
& \\
& =\frac{2+\sqrt{10}}{3}, \frac{2-1 \sqrt{10}}{3}+\frac{\sqrt{10}}{3}, \frac{2}{3}-\frac{\sqrt{10}}{3}
\end{aligned}
$$

(4)

$$
\begin{aligned}
& x=\frac{2 \pm \sqrt{4-60}}{10}=\frac{2 \pm \sqrt{-54}}{10} \\
& \\
&
\end{aligned}
$$

