$ax^2+bx+c=0$

$x^2+\frac{bx}{a}+\frac{c}{a}=0 \quad \div a$

$\frac{bx}{a}\cdot\frac{1}{2}=\frac{bx}{2a}$

$x\left(\frac{bx}{2a}\right)^2=\left(\frac{bx}{2a}\right)^2=x\left(\frac{b}{2a}\right)^2$

$x^2+\frac{bx}{a}+\frac{c}{a}+\left(\frac{b}{2a}\right)^2=\left(\frac{b}{2a}\right)^2$

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

$\omega=\frac{b}{a}$

$\frac{b}{a}\cdot\frac{1}{2}=\frac{b}{2a}$

$\left(\frac{b}{2a}\right)^2=\frac{b^2}{4a^2}$

$x^2+\frac{b}{a}x+\frac{b^2}{4a^2}=-\frac{c}{a}+\frac{b^2}{4a^2}$

$\left(x+\frac{b}{2a}\right)^2=\frac{b^2}{4a}-\frac{c}{a}$

$\left(x+\frac{b}{2a}\right)^2=\frac{b^2-4c}{4a}$!!!

$x+\frac{b}{2a}=\pm\sqrt{\frac{b^2-4c}{4a}}$?

$x=-\frac{b}{2a}\pm\sqrt{\frac{b^2-4c}{4a}} \longrightarrow x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

Research square root rules

Multiplication: $\sqrt[n]{xy}=\sqrt[n]{x}\cdot\sqrt[n]{y}$

division: $\sqrt[n]{\frac{x}{y}}=\frac{\sqrt[n]{x}}{\sqrt[n]{y}}$

$\sqrt[n]{x+y}\neq\sqrt{x}+\sqrt{y}$

$x=-\frac{b}{2a}\pm\frac{\sqrt{b^2-4c}}{\sqrt{4a}}$

$=-\frac{b}{2a}\pm\frac{\sqrt{b^2-4c}}{\sqrt{4}\cdot\sqrt{a}}$ $\quad\sqrt{\frac{x}{y}}=\frac{\sqrt{x}}{\sqrt{y}}$

$=-\frac{b}{2a}\pm\frac{\sqrt{b^2-4c}}{2\sqrt{a}}$ $\quad\sqrt{xy}=\sqrt{x}\cdot\sqrt{y}$

$x=-\frac{b}{2a}\pm\frac{\sqrt{b^2-4c}}{2\sqrt{a}}$

$=-\frac{b}{2a}\pm\left(\frac{\sqrt{b^2-4c}\cdot\sqrt{a}}{2\sqrt{a}\cdot\sqrt{a}}\right)\cdot\sqrt{a}$ $\quad\sqrt{x}\cdot\sqrt{y}=\sqrt{xy}$

$=-\frac{b}{2a}\pm\frac{\sqrt{b^2-4ac}}{2a}$

$=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$\frac{\sqrt{b^2-4c}\cdot\sqrt{a}}{2\sqrt{a}\cdot\sqrt{a}} \longrightarrow \frac{\sqrt{b^2-4ca}}{2a}$?

$\sqrt{b^2-4c}\cdot\sqrt{a}=\sqrt{b^2-4ac}$

$\sqrt{b^2a-4c}\neq\sqrt{b^2-4ac}$

$(a-b)c=ca-ba$

Mistake, forgot $\frac{b^2}{4a}\rightarrow\frac{b^2}{4a^2}$

Correct Form

$ax^2+bx+c=0$

$ax^2+bx=-c$

~~$b \cdot \frac{1}{2} = \frac{b}{2}$~~

~~$(\frac{b}{2})^2 =$~~

$x^2+\frac{b}{a}x=\frac{-c}{a} \quad \div a$

$\frac{b}{a} \cdot \frac{1}{2} = \frac{b}{a2}$

$(\frac{b}{2a})^2 = \frac{b}{4a^2}$

$x^2+\frac{b}{a}x+\frac{b^2}{4a^2}=\frac{-c}{a}+\frac{b^2}{4a^2}$

$(x+\frac{b}{2a})^2=\frac{-ac}{4a^2}+\frac{b^2}{4a^2}$

$(x+\frac{b}{2a})^2=\frac{b^2-ac}{4a^2}$

$x+\frac{b}{2a}=\pm\sqrt{\frac{b^2-ac}{4a^2}}$

$x+\frac{b}{2a}=\pm\frac{\sqrt{b^2-ac}}{2a}$

$x=\frac{-b}{2a}+\frac{\pm\sqrt{b^2-4ac}}{2a}$

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$