Problem 19) This problem may be solved by completing the square, as follows:

$$ax^2+bx+c=a\left(x+\frac{b}{2a}\right)^2-\frac{b^2}{4a}+c=0 \quad \rightarrow \quad x+\frac{b}{2a}=\pm\sqrt{\frac{b^2}{4a^2}-\frac{c}{a}}$$

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

Note that, since the coefficients a, b, and c of the quadratic equation are complex-valued, the square-root must be evaluated in the complex plane. However, the $\pm$ sign in the above expressions is appropriate because the two roots of the complex number (b^2-4ac) differ from each other by a phase angle of π, which results in the coefficient $\exp(\mathrm{i}\pi)=-1$.