The Quartic Formula

Nuevo Math i

All the roots of $y = ax^4 + bx^3 + cx^2 + dx + e$ are given by:

$$\text{root \#1:}\quad x = -\frac{b}{4a} - \frac{\sqrt{6}\left(\left(\frac{1}{2}\right)^{\frac{1}{2}} a\left(\frac{\sqrt{3}}{2} - \frac{i}{2}\right)\left(\frac{2}{3}\left(\frac{3}{2}\right)^{\frac{1}{2}} \left(\frac{2c^3}{a^3} - \frac{9\,(bd - 4\,ae)\,c}{a^2} + \frac{27\,(b^2e + (d^2 - 4\,ae)\,a)}{a^3} + \frac{9}{2}\sqrt{\frac{9\,a^2d^2 - \frac{27}{2}\,a^3e^2}{a^6}} + \left[\left(2\,b^3 - 9\,abc + 27\,a^2d\right)^2 - \left[\left(c^2 - 3\,ae\right)^3 + \left[\left(27\,a^2 - 144\,ad^2c + 128\,a^2c^2 + 192\,a^2be^2 + \left[\left(2\,b^3c^2 - 8\,ac^3 + 3\,(ad^2 - 24\,a^2c)\,b^2 - (9\,b^2c - 40\,abc^2)\,d\right)\right.\right.\right.