

# Solvable Sextic equation

$$x^6 + Px^4 + Qx^3 + Rx^2 + \frac{PQ}{3}x + \frac{PR}{3} - 2\frac{P^3}{27} = 0$$

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## Abstract

*We give a new solvable sextic equation and its solution.*

The sextic equation  $x^6 + Px^4 + Qx^3 + Rx^2 + \frac{PQ}{3}x + \frac{PR}{3} - 2\frac{P^3}{27} = 0$  is solvable and its solution is :

$$x = \pm \sqrt{-\frac{P}{3} - \frac{Q}{4t_0} + 2tt_0}$$

Here:

$$t^2 = -\frac{P}{3} - t_0^2 - \frac{Q}{4t_0}$$

$$t_0^2 = \sqrt[3]{\frac{19P^3}{5832} - \frac{PR}{72} + \frac{Q^2}{128} + \sqrt{\left(\frac{19P^3}{5832} - \frac{PR}{72} + \frac{Q^2}{128}\right)^2 + \frac{(5P^2 - 27R)^3}{2916}}}$$
$$+ \sqrt[3]{\frac{19P^3}{5832} - \frac{PR}{72} + \frac{Q^2}{128} - \sqrt{\left(\frac{19P^3}{5832} - \frac{PR}{72} + \frac{Q^2}{128}\right)^2 + \frac{(5P^2 - 27R)^3}{2916}}} - \frac{P}{9}$$

## References

- [1] Sextic equation - Wikipedia
- [2] Quang N V, A proof of the four color theorem by induction Vixra: 1601.0247 (CO)

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