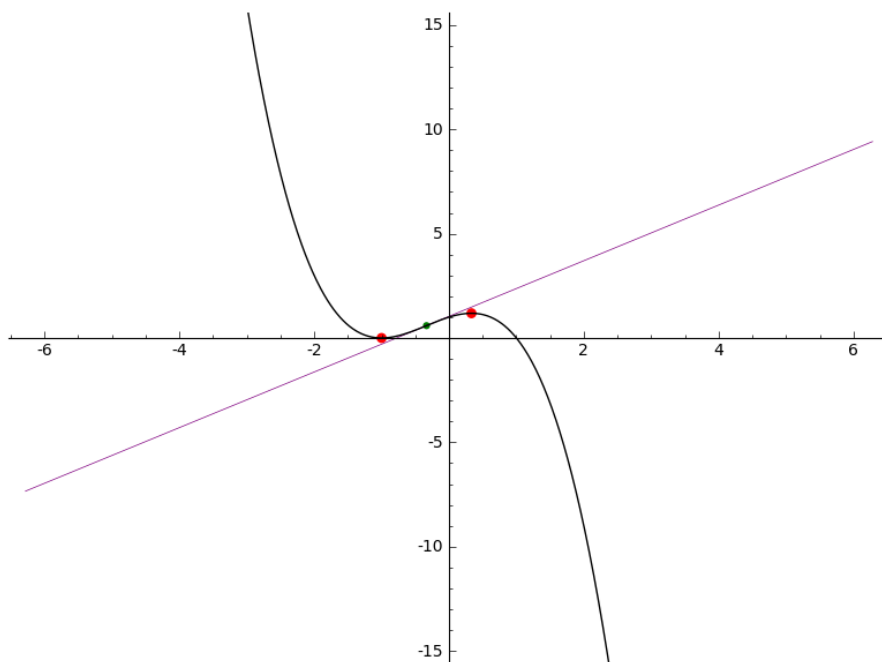


**Function**  $x \mapsto -x^3 - x^2 + x + 1$



By analyzing the sign of the first derivative  $x \mapsto -3x^2 - 2x + 1$ :

- stationary points are  $\{(-1, 0); (\frac{1}{3}, \frac{32}{27})\}$
- is increasing for intervals  $\{(-1, \frac{1}{3})\}$
- is decreasing for intervals  $\{(-\infty, -1); (\frac{1}{3}, +\infty)\}$

By analyzing the sign of the second derivative  $x \mapsto -6x - 2$ :

- inflection points are  $\{(-\frac{1}{3}, \frac{16}{27})\}$
- is convex for intervals  $\{(-\infty, -\frac{1}{3})\}$
- is concave for intervals  $\{(-\frac{1}{3}, +\infty)\}$

where  $k \in \mathbb{Z}$ .