

$$f := x \mapsto x^3 - x - 1$$

$$f := x \mapsto x^3 - x - 1 \quad (1)$$

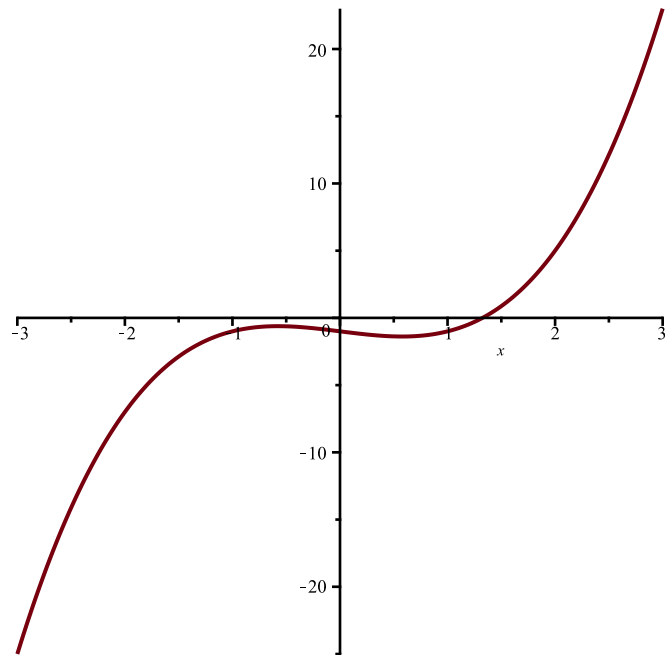
$$fp := D(f)$$

$$fp := x \mapsto 3 \cdot x^2 - 1 \quad (2)$$

$$newton := x \mapsto x - \frac{f(x)}{fp(x)}$$

$$newton := x \mapsto x - \frac{f(x)}{fp(x)} \quad (3)$$

$$fplot := plot(f(x), x = -3..3)$$



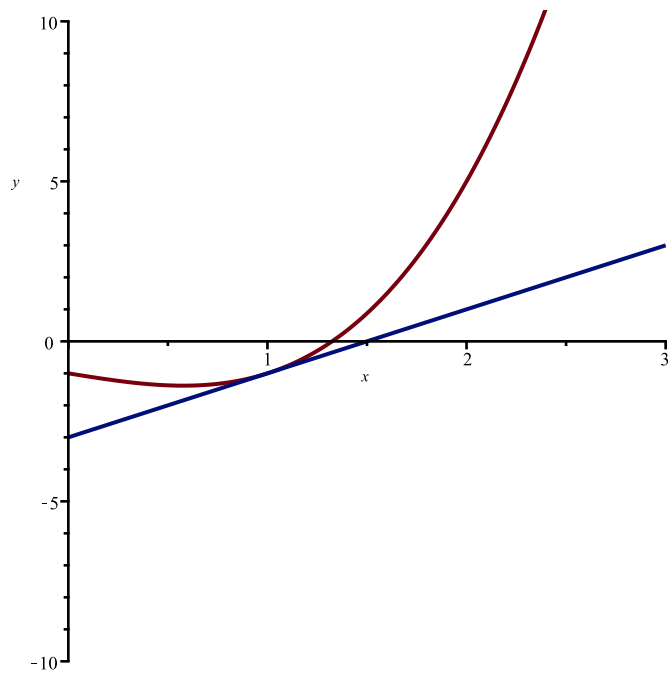
$$tanline := (x, y) \mapsto fp(y) \cdot (x - y) + f(y)$$

$$tanline := (x, y) \mapsto fp(y) \cdot (x - y) + f(y) \quad (4)$$

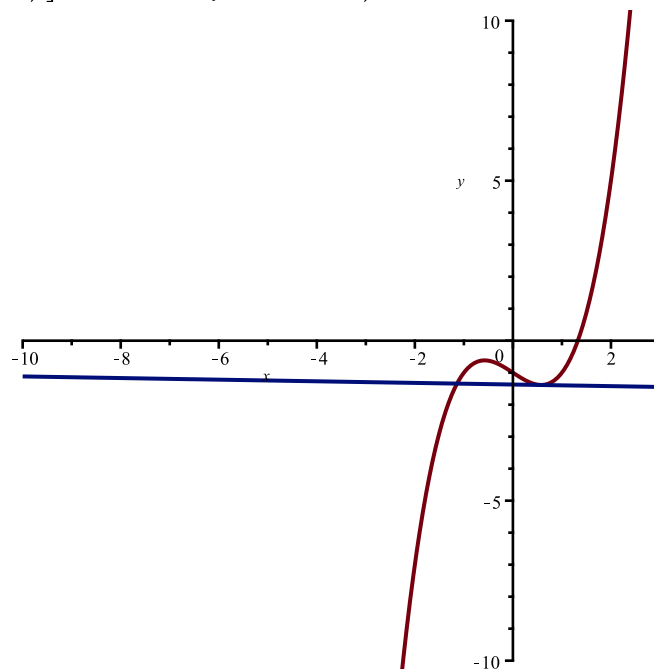
$$tanline(x, 1)$$

$$2x - 3 \quad (5)$$

$$plot([f(x), tanline(x, 1)], x = 0..3, y = -10..10)$$



`plot([f(x), tanline(x, 0.57)], x=-10..3, y=-10..10)`



`solve(fp(x)=0)`

$$\frac{\sqrt{3}}{3}, -\frac{\sqrt{3}}{3}$$

(6)

`evalf(%)`

$$0.5773502693, -0.5773502693$$

(7)