

```

> f := x -> x^(1/4);
taylor(f(x), x=1, 1);
taylor(f(x), x=1, 2);
taylor(f(x), x=1, 3);
taylor(f(x), x=1, 4);

```

$$\begin{aligned}
 & f := x \rightarrow x^{1/4} \\
 & 1 + O(x-1) \\
 & 1 + \frac{1}{4} (x-1) + O((x-1)^2) \\
 & 1 + \frac{1}{4} (x-1) - \frac{3}{32} (x-1)^2 + O((x-1)^3) \\
 & 1 + \frac{1}{4} (x-1) - \frac{3}{32} (x-1)^2 + \frac{7}{128} (x-1)^3 + O((x-1)^4)
 \end{aligned}
 \tag{1}$$

```

> f := x -> x^(1/4);
taylor(f(x), x=2, 1);
taylor(f(x), x=2, 2);
taylor(f(x), x=2, 3);
taylor(f(x), x=2, 3);

```

$$\begin{aligned}
 & f := x \rightarrow x^{1/4} \\
 & 2^{1/4} + O(x-2) \\
 & 2^{1/4} + \frac{1}{8} 2^{1/4} (x-2) + O((x-2)^2) \\
 & 2^{1/4} + \frac{1}{8} 2^{1/4} (x-2) - \frac{3}{128} 2^{1/4} (x-2)^2 + O((x-2)^3) \\
 & 2^{1/4} + \frac{1}{8} 2^{1/4} (x-2) - \frac{3}{128} 2^{1/4} (x-2)^2 + O((x-2)^3)
 \end{aligned}
 \tag{2}$$

```

> f := x -> x^(1/4);
T1 := x -> 1 + 1/4 (x-1);
T2 := x -> 1 + 1/4 (x-1) - 3/32 (x-1)^2;
T3 := x -> 1 + 1/4 (x-1) - 3/32 (x-1)^2;
T4 := x -> 1 + 1/4 (x-1) - 3/32 (x-1)^2 + 7/128 (x-1)^3;
plot({f(x), T1(x), T2(x), T3(x), T4(x)}, x = -1..3);
plot({f(x), T1(x), T2(x), T3(x), T4(x)}, x = -10..10);

```

$$\begin{aligned}
 & f := x \rightarrow x^{1/4} \\
 & T_1 := x \rightarrow \frac{3}{4} + \frac{1}{4} x \\
 & T_2 := x \rightarrow \frac{3}{4} + \frac{1}{4} x - \frac{3}{32} (x-1)^2
 \end{aligned}$$

$$T_3 := x \rightarrow \frac{3}{4} + \frac{1}{4}x - \frac{3}{32}(x-1)^2$$

$$T_4 := x \rightarrow \frac{3}{4} + \frac{1}{4}x - \frac{3}{32}(x-1)^2 + \frac{7}{128}(x-1)^3$$



