

$$D(c) = 0 \quad \forall c \in \mathbf{R}$$

$$D(mx + q) = m \quad \forall m, q \in \mathbf{R}$$

$$D(5x - 4) = 5$$

$$m = 5$$

$$q = -4$$

$$D(2x + 9) = 2$$

$$D(14 - x) = -1 \quad (m = -1 \quad q = 14)$$

$$D(x) = 1 \quad (m = 1 \quad q = 0)$$

$$D(-x) = -1$$

$$D(0) = 0$$

$$D(x^\alpha) = \alpha x^{\alpha-1} \quad \forall \alpha \in \mathbf{R}$$

$$D(x^7) = 7x^6$$

$$D(x^4) = 4x^3$$

$$D(x^\pi) = \pi x^{\pi-1}$$

$$D(x^{\sqrt{2}}) = \sqrt{2} x^{\sqrt{2}-1}$$

$$D(x^{\frac{1}{2}}) = \frac{1}{2} x^{-\frac{1}{2}}$$

$$D(x^{\frac{3}{4}}) = \frac{3}{4} x^{\frac{3}{4}-1} = \frac{3}{4} x^{-\frac{1}{4}}$$

$$D(x^{-5}) = -5x^{-6}$$

$$D(a^x) = a^x \log a \quad \forall a > 0$$

$$D(5^x) = 5^x \log 5$$

$$D(8^x) = 8^x \log 8$$

$$D(14^x) = 14^x \log(14)$$

$$D(e^x) = e^x \log e = e^x$$

$$D(\log_a x) = \frac{1}{x \log a} \quad \forall 0 < a \neq 1$$

$$D(\log_7 x) = \frac{1}{x \log 7}$$

$$D(\log_3 x) = \frac{1}{x \log 3}$$

$$D(\operatorname{tg}x) = \frac{1}{\cos^2 x} = 1 + \operatorname{tg}^2 x$$

$$\begin{aligned} \frac{1}{\cos^2 x} &= \frac{\operatorname{sen}^2 x + \cos^2 x}{\cos^2 x} = \frac{\operatorname{sen}^2 x}{\cos^2 x} + \frac{\cancel{\cos^2 x}}{\cancel{\cos^2 x}} = \left(\frac{\operatorname{sen} x}{\cos x} \right)^2 + 1 \\ &= 1 + \operatorname{tg}^2 x \end{aligned}$$

$$D(x^2 + x^3) = 2x + 3x^2$$

$$\begin{aligned} D(x \operatorname{sen} x) &= D(x) \operatorname{sen} x + x D(\operatorname{sen} x) \\ &= \operatorname{sen} x + x \cos x \end{aligned}$$

$$D(f \cdot g) = f' \cdot g + f g'$$