Calcola le seguenti derivate:

$$y=\frac{2}{x\sqrt{x}-2}=\frac{1}{x^{\frac{3}{2}}-2}$$

$$y'=\frac{-2\cdot\frac{3}{2}x^{\frac{1}{2}}}{\left(x^{\frac{3}{2}}-2\right)^2}=-\frac{3\sqrt{x}}{\left(x\sqrt{x}-2\right)^2}$$

$$y=\frac{e^x\,(x+1)}{x^2}=e^x\left(\frac{1}{x}+\frac{1}{x^2}\right)$$

$$y'=e^x\left(\frac{1}{x}+\frac{1}{x^2}\right)+e^x\left(-\frac{1}{x^2}-\frac{2}{x^3}\right)=e^x\left(\frac{1}{x}+\frac{1}{x^2}-\frac{1}{x^2}-\frac{2}{x^3}\right)=e^x\,\frac{x^2-2}{x^3}$$

$$y=\sin x\cot x=\sin x\,\frac{\cos x}{\sin x}=\cos x$$

$$y'=-\sin x$$

$$y=2\sqrt[3]{x}+\sqrt[3]{x^2}+\frac{1}{\sqrt[3]{x^2}}+\frac{2}{\sqrt[3]{x}}=$$
$$=2x^{\frac{1}{3}}+x^{\frac{2}{3}}+x^{-\frac{2}{3}}+2\,x^{-\frac{1}{3}}$$

$$y'=2\cdot\frac{1}{3}x^{-\frac{2}{3}}+\frac{2}{3}x^{-\frac{1}{3}}-\frac{2}{3}x^{-\frac{5}{3}}-\frac{2}{3}x^{-\frac{4}{3}}=\frac{2}{3\sqrt[3]{x^2}}+\frac{2}{3\sqrt[3]{x}}-\frac{2}{3x\sqrt[3]{x^2}}-\frac{2}{3x\sqrt[3]{x}}=$$
$$=2\cdot\frac{x+x\sqrt[3]{x}-1-\sqrt[3]{x}}{3x\sqrt[3]{x^2}}=\frac{2(x-1)\left(1+\sqrt[3]{x}\right)}{3\,x\sqrt[3]{x^2}}$$

$$y=\frac{x+\sqrt{x}}{\sqrt{x}}=\sqrt{x}+1$$

$$y'=\frac{1}{2\sqrt{x}}$$

$$y=\frac{3x+2}{4x}=\frac{3}{4}+\frac{1}{2x}$$

$$y'=-\frac{1}{2x^2}$$

$$y=\frac{1}{x}+2\ln x+\frac{\ln x}{x}$$

$$y'=-\frac{1}{x^2}+\frac{2}{x}+\frac{1}{x^2}-\frac{\ln x}{x^2}=\frac{2}{x}-\frac{\ln x}{x^2}=\frac{2x-\ln x}{x^2}$$

$$y=\frac{x-1}{x+1}$$

$$y'=\frac{x+1-(x-1)}{(x+1)^2}=\frac{x+1-x+1}{(x+1)^2}=\frac{2}{(x+1)^2}$$

$$y=\frac{4}{x-2}$$

$$y'=-\frac{4}{(x-2)^2}$$

$$y=\frac{1+\sin x}{1-\cos x}$$

$$y'=\frac{\cos x\,(1-\cos x)-\sin x\,(1+\sin x)}{(1-\cos x)^2}=\frac{\cos x-\cos^2 x-\sin x-\sin^2 x}{(1-\cos x)^2}=$$
$$=\frac{\cos x-\sin x-1}{(1-\cos x)^2}$$