Derivate

Calcolare le derivate delle seguenti funzioni

1. $y = 3x^2 - 2x + \sqrt[3]{x}$ $\qquad y' = 6x - 2 + \frac{1}{3\sqrt[3]{x^2}}$
2. $y = \frac{x-1}{x+2}$ $\qquad y' = \frac{3}{(x+2)^2}$
3. $y = \frac{e^x}{e^x+1}$ $\qquad y' = \frac{e^x}{(e^x+1)^2}$
4. $y = \frac{e^x \sin x}{e^x \cos x+1}$ $\qquad y' = \frac{e^x(1+\sin x+\cos x)}{(e^x \cos x+1)^2}$
5. $y = (x^2-2)\sin x$ $\qquad y' = 2x \sin x + (x^2-2)\cos x$
6. $y = \frac{\ln x}{3\ln x-2}$ $\qquad y' = -\frac{2}{x(3\ln x-2)^2}$
7. $y = \frac{x^2 e^x}{x-1}$ $\qquad y' = \frac{xe^x(x^2-2)}{(x-1)^2}$
8. $y = e^x \cdot \sin x \cdot \ln x \cdot x^2$ $\qquad y' = xe^x(x \ln x(\sin x + \cos x) + \sin x(1 + 2\ln x))$

Calcolare le derivate delle seguenti funzioni (funzioni inverse e composte)

1. $y = \sqrt{x^2 - 5x + 1}$ $\qquad y' = \frac{2x-5}{2\sqrt{x^2-5x+1}}$
2. $y = (\cos x)^3$ $\qquad y' = -3 \sin x (\cos x)^2$
3. $y = \sqrt{\ln x}$ $\qquad y' = \frac{1}{2x\sqrt{\ln x}}$
4. $y = \sin(x^3 - 2x)$ $\qquad y' = (3x^2 - 2)\cos(x^3 - 2x)$
5. $y = (\ln(x^2 - 5))^5$ $\qquad y' = \frac{10x}{x^2-5}(\ln(x^2 - 5))^4$
6. $y = \arcsin(x^2)$ $\qquad y' = \frac{2x}{\sqrt{1-x^4}}$
7. $y = e^{-\frac{x^2-1}{x}}$ $\qquad y' = -\frac{x^2+1}{x^2} e^{-\frac{x^2-1}{x}}$
8. $y = x^{\sin x}$ $\qquad y' = x^{\sin x}\left(\cos x \ln x + \frac{\sin x}{x}\right)$
9. $y = \ln \arctan \frac{x-1}{x+2}$ $\qquad y' = \frac{3}{(2x^2+2x+5)\arctan \frac{x-1}{x+2}}$
10. $y = e^{\sin \ln(x^2+2)}$ $\qquad y' = e^{\sin \ln(x^2+2)} \cdot \cos \ln(x^2 + 2) \cdot \frac{2x}{x^2+2}$