ICE - Inverse Trig Derivatives

Calculate formulas for the first derivative of the functions given in the table below.

Function	Derivative
$f(x)=\sin(x)\cdot\sin^{-1}(x)$	
$f(x)=\sin\left(\sin^{-1}(x)\right)$	
$f(x)=\sin^{-1}\left(x^2\right)$	
$f(x)=\cos(x)\cdot\tan^{-1}(x)$	
$f(x)=\dfrac{\cos^{-1}(x)}{\cos(x)}$	
$f(x)=\tan^{-1}\left(1+\cos(x)\right)$	
$f(x)=\sin^{-1}(x)\cdot\cos^{-1}(x)$	
$f(x)=\cos^{-1}(x)+\left[\cos(x)\right]^{-1}$	

Answers: (a) $f'(x) = \cos(x)*\sin^{-1}(x) + \sin(x)/(1 - x^2)^{1/2}$. (b) $f'(x) = \cos(\sin^{-1}(x))/(1 - x^2)^{1/2}$.
(c) $f'(x) = 2x/(1 - x^4)^{1/2}$. (d) $f'(x) = -\sin(x)*\tan^{-1}(x) + \cos(x)/(1 + x^2)$.
(e) $f'(x) = [-\cos(x)/(1 - x^2)^{1/2} + \sin(x)*\cos^{-1}(x)]/\cos^2(x)$. (f) $f'(x) = -\sin(x)/[1 + (1 + \cos(x))^2]$.
(g) $f'(x) = [\cos^{-1}(x) - \sin^{-1}(x)]/(1 - x^2)^{1/2}$. (h) $f'(x) = -1/(1 - x^2)^{1/2} + \sin(x)/\cos^2(x)$.