Calc 1 Worksheet 4: All Differentiation Rules

Rules for Derivatives		
$(x^n)' = nx^{n-1}$ for any real n	$\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$	$(\sin x)' = \cos x \quad (\cos x)' = -\sin x$
$(b^x)' = (\ln b)b^x$ for any $b > 0$	$(e^x)' = e^x$	$(\ln x)' = \frac{1}{x}$
$(cf)' = cf'$ for constant c $(f \pm g)' = f' \pm g'$	$[f(g(x))]' = f'(g(x))g'(x)$	$(fg)' = f'g + g'f \quad \left(\frac{f}{g}\right)' = \frac{f'g - g'f}{g^2}$

Find the derivatives of the following functions:

1. $f(x) = \sqrt{\frac{1+x^2}{1-x^2}}$	2. $f(x) = e^{3x} \tan x$
3. $f(x) = 2^{x \cos x}$	4. $f(x) = [\ln(5x + \sin(5x))]^6$