Math Xb—Spring 2004

Problems on Derivatives of Trigonometric and Inverse Trigonometic Functions

1. Find the derivative of $y = \sin x + \cos(2x)$.
2. Find the derivative of $y = \tan x - \arctan x$.
3. Find the derivative of $y = \sin(x^2 - x + 1) + \cos^{-1} x$.
4. Find the derivative of $f(t) = \ln t + \sec t$.
5. Find the derivative of $g(t) = \dfrac{\cot t}{1 - t^2}$.
6. Find the derivative of $h(t) = t \csc t$.
7. Find the derivative of $g(z) = z^2 \arcsin z$.
8. Find the derivative of $y = e^x \sin x$.
9. Find the derivative of $y = (\sin(x^2 - 3x + 6))^{10}$.
10. Find the derivative of $y = \sin^2 x + \cos^2 x$.

Answers

1. $y' = \cos x - 2\sin(2x)$.
2. $y' = \sec^2 x - \dfrac{1}{1 + x^2}$.
3. $y' = (2x - 1)\cos(x^2 - x + 1) - \dfrac{1}{\sqrt{1 - x^2}}$.
4. $f'(t) = \dfrac{1}{t} + \sec t \tan t$.
5. $g'(t) = \dfrac{-(1 - t^2)\csc^2 t + 2t \cot t}{(1 - t^2)^2}$.
6. $h'(t) = \csc t - t \csc t \cot t$.
7. $g'(z) = 2z \arcsin z + \dfrac{z^2}{\sqrt{1 - z^2}}$.
8. $y' = e^x \sin x + e^x \cos x$.
9. $y' = 10(2x - 3)(\sin(x^2 - 3x + 6))^9 \cos(x^2 - 3x + 6)$.
10. $y' = 0$.