

Calculus I

Homework

Trigonometric derivatives

1. Compute the derivative.

(a) $f(x) = 2x^3 - 3 \cos x$.

(b) $f(x) = \sqrt{x} \cos x$.

(c) $f(x) = \sin x + \frac{1}{3} \cot x$.

(d) $y = 2 \sec x - \csc x$.

(e) $y = \frac{1 + \sin^2 \theta}{\cos^3 \theta}$.

(f) $g(t) = 4 \sec t + \tan t - \csc t + 3 \cot t$.

(g) $y = c \cos t + t^2 \sin t$.

(h) $y = u(a \cos u + b \cot u)$.

(i) $y = \frac{x}{2 - \tan x}$.

(j) $y = \sin \theta \cos \theta$.

(k) $f(\theta) = \frac{\sec \theta}{1 + \sec \theta}$.

(l) $y = \frac{\cos x}{1 - \sin x}$.

(m) $y = \frac{t \sin t}{1 + t}$.

(n) $y = \frac{1 - \sec x}{\tan x}$.

(o) $h(\theta) = \theta \csc \theta - \cot \theta$.

(p) $y = x^2 \sin x \tan x$.

2. Differentiate.

(a) $\tan x$.

(b) $\cot x$.

(c) $\sec x$.

(d) $\csc x$.

(e) $\sec x \tan x$.

(f) $\sec x + \tan x$.

(g) $\sec^2 x$.

(h) $\csc^2 x$.

(i) $f(x) = (\sec x)e^x$.

(j) $f(x) = (\tan x)e^x$.

(k) $\frac{\sin x}{x}$.

(l) $\frac{\sin x}{e^x}$.

(m) $x(\cos x)e^x$.

(n) $\frac{e^x}{\tan x}$.

(o) $\frac{e^x}{\sec x} + \sec x$.