MAT3-119 Calculus of a Single Variable

Quiz 6 November 16, 2015

solution

name

You must either justify your answers and/or show your work. Don't approximate your answers unless directed to do so. Graphing calculators are allowed.

1. (6 pts.) Find the derivative of the following functions:

a. $f(x) = x^4 2^x$

$4x^3 2^x + x^4 \ln 2 \, 2^x$

b. $g(x) = \sqrt{1-x^2}$

$\frac{1}{2\sqrt{1-x^2}} \cdot -2x = \frac{-x}{\sqrt{1-x^2}}$

c. $\cos^2(x^3) = (\cos(x^3))^2$

$y' = 2(\cos(x^3)) \cdot -\sin(x^3) \cdot 3x^2$

2. (4 pts.) Use the quotient rule to derive the formula for the derivative of tan x.

$(\tan x)' = \left(\frac{\sin x}{\cos x}\right)' = \frac{\cos x \cdot \cos x - \sin x \cdot -\sin x}{(\cos x)^2}$

$= \frac{1}{(\cos x)^2} = \sec^2 x$