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Quiz 1

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. *(1 mark each)* Differentiate the following functions:

a.

$f(x) = \frac{1}{x^{8/7}} = x^{-8/7}$ $\quad f'(x) = \frac{-8}{7} x^{-15/7} = \frac{-8}{7x^{15/7}}$

b.

$f(x) = \cos x$ $\quad f'(x) = -\sin x$

c.

$f(x) = \tan x$ $\quad f'(x) = \sec^2 x$

d.

$f(x) = e^x$ $\quad f'(x) = e^x$

e.

$f(x) = \csc x$ $\quad f'(x) = -\csc x \cot x$

f.

$f(x) = \arcsin x$ $\quad f'(x) = \frac{1}{\sqrt{1-x^2}}$

Question 2. *(2 marks each)* Differentiate the following functions *(do not simplify)*:

a.

$f(x) = (\arctan x)(\operatorname{arcsec} \ln x)$ $\quad f'(x) = \frac{1}{1+x^2} \operatorname{arcsec}(\ln x) + \arctan x \frac{1}{\ln x \sqrt{(\ln x)^2 - 1}} \cdot \frac{1}{x}$

b.

$f(x) = \left(\frac{\tan 3x}{\csc 2x}\right)^2$

$f'(x) = 2\left(\frac{\tan 3x}{\csc 2x}\right)\left[\frac{\sec^2 3x\,(3)\csc(2x) - \tan 3x\,(-1)\csc 2x \cot 2x\,(2)}{(\csc 2x)^2}\right]$