MATH 211 CP LT7 LT8 LT9

Tyeon Ford

TOTAL POINTS

2 / 3

QUESTION 1

1 LT7 1 / 1

✓ **+ 1 pts** ✔ *Correct: The solution demonstrates complete mastery of the given Target.*

+ 0 pts * Revision: The solution might demonstrate complete mastery of the given Target, but needs to be revised for clarity/accuracy.

+ 0 pts ⚠ Issues: The solution demonstrates partial understanding of the given Target, but has one or more issues that suggest that further study is required to develop complete mastery.

+ 0 pts x: More practice is needed to demonstrate understanding of the given Target.

+ 0 pts Not completed/Already mastered

QUESTION 2

2 LT8 1 / 1

✓ **+ 1 pts** ✔ *Correct: The solution demonstrates complete mastery of the given Target.*

+ 0 pts * Revision: The solution might demonstrate complete mastery of the given Target, but needs to be revised for clarity/accuracy.

+ 0 pts ⚠ Issues: The solution demonstrates partial understanding of the given Target, but has one or more issues that suggest that further study is required to develop complete mastery.

+ 0 pts x: More practice is needed to demonstrate understanding of the given Target.

+ 0 pts Not completed/Already mastered

QUESTION 3

3 LT9 0 / 1

+ 1 pts ✔ Correct: The solution demonstrates complete mastery of the given Target.

+ 0 pts * Revision: The solution might demonstrate complete mastery of the given Target, but needs to be revised for clarity/accuracy.

+ 0 pts ⚠ Issues: The solution demonstrates partial understanding of the given Target, but has one or more issues that suggest that further study is required to develop complete mastery.

✓ **+ 0 pts** *x: More practice is needed to demonstrate understanding of the given Target.*

+ 0 pts Not completed/Already mastered

To solve these, you need to know three derivatives, for ln(x), tan(x), and arcsin(x). You also need to know how to compute basic derivatives.

MATH 211: Calculus I F23 CP LT7 LT8 LT9

Name: Tyeon Ford

LT7: I can apply the Product and Quotient Rules to differentiate functions.

1. **Show your work.** Your answer should include proper derivative notation; for example, the derivative of $p(z)$ would be labelled "$p'(z) =$" or "$\frac{dp}{dz} =$".

(a) Find the derivative of $s(x) = \frac{x^3}{1+x^2}$. Quotient

$f(x) = x^3$
$f'(x) = 3x^2$
$g(x) = 1+x^2$
$g'(x) = 2x$

$$s'(x) = \frac{(3x^2)(1+x^2) - (2x)(x^3)}{(1+x^2)^2}$$

(b) Find $f'(x)$ given $f(x) = \sqrt{x}\cos(x)$. Product

$f(x) = x^{\frac{1}{2}}$
$f'(x) = \frac{1}{2}x^{-\frac{1}{2}}$
$g(x) = \cos(x)$
$g'(x) = -\sin(x)$

$$f'(x) = \left(\frac{1}{2}x^{-\frac{1}{2}}\right)(\cos(x)) + \left(x^{\frac{1}{2}}\right)(-\sin(x))$$

(c) Find the derivative of $f(x) = Axe^x$ given that A is a constant.

$f(x) = Ax$
$f'(x) = A$
$g(x) = e^x$
$g'(x) = e^x$

$$f'(x) = (A)(e^x) + (Ax)(e^x)$$

(d) Find $h'(x)$ given $h(x) = \frac{\tan(x)}{2^x+5}$. Quotient

$f(x) = \tan(x)$
$f'(x) = \sec^2 x$
$g(x) = 2^x + 5$
$g'(x) = 2^x \cdot \ln(2)$

$$h'(x) = \frac{(\sec^2 x)(2^x+5) - (2^x \cdot \ln(2))(\tan x)}{(2^x+5)^2}$$

LT8: I can apply the Chain Rule to differentiate composite functions.

1. **Show your work.** Your answer should include proper derivative notation; for example, the derivative of $p(z)$ would be labelled "$p'(z) =$" or "$\frac{dp}{dz} =$".

   (a) Find the derivative of $f(x) = \sqrt{3x-5}$.

   Inner $3x-5 \to 3$

   $\sqrt{x}$ outer $(3x-5)^{\frac{1}{2}} \to \frac{1}{2}(3x-5)^{-\frac{1}{2}}$

   $f'(x) \quad \frac{1}{2}(3x-5)^{\frac{1}{2}} \cdot (3)$

   (b) Find $g'(t)$ given $g(x) = (x^3 - 2x^2 + 5)^4$.

   x^4 Inner $= x^3 - 2x^2 + 5 \to 3x^2 - 4x$

   outer $= (x^3 - 2x^2 + 5)^4 \to 4(x^3 - 2x^2 + 5)^3$

   $g'(x) = 4(x^3 - 2x^2 + 5)^3 \cdot (3x^2 - 4x)$

   (c) Find the derivative of $s(x) = \sin(x^3 + 2)$.

   Inner $x^3 + 2 \to 3x^2$

   $\sin(x)$ outer $\sin(x^3+2) \to \cos(x^3+2)$

   $s'(x) = \cos(x^3+2) \cdot (3x^2)$

   (d) Find the derivative of $h(t) = 5e^{2t}$.

   $5e^x$ Inner $2t \to 2$

   outer $5e^{2t} \to 5e^{2t}$

   $h'(t) = (5e^{2t})(2)$

LT9: I can compute derivatives of basic inverse functions including logarithmic and inverse trigonometric functions.

1. **Show your work.** Your answer should include proper derivative notation; for example, the derivative of $p(z)$ would be labelled "$p'(z) =$" or "$\frac{dp}{dz} =$".

   (a) Find the derivative of $f(x) = 5\ln(x) + \arcsin(x)$.

   $f'(x) = \frac{5}{x} + \arccos(x)$

   (b) Find the derivative of $g(t) = 3\arctan(x)$.

   $g'(t) = 3\operatorname{arcsec}^2(x)$

   (c) Create an inverse function and take its derivative.

   $f(x) = \ln(x)$

   $f'(x) = \frac{1}{x}$