

Complete the following questions by hand before you go to the computer lab. Show your work and write the final answer in the space provided.

1. Find the following derivatives.

(a) $\frac{d}{dx} \frac{1}{\sqrt{x}}$

(b) $\frac{d}{dt} \sin^3 t$

2. Find and evaluate the following derivatives. Give exact values (no decimals) and simplify.

(a) $\frac{d}{dx} \sin(\sin x) \Big|_{x=\frac{\pi}{3}}$

(b) $\frac{d^2}{dx^2} \sin 2x \Big|_{x=\frac{\pi}{6}}$

3. Find the absolute maximum and minimum values of $f(x) = \frac{x+1}{x^2+3}$ on the closed interval $[0, 2]$.

Max _____

Min _____

From the Math 100 index screen, click on “Differentiation.” You will learn how to find and evaluate derivatives using the `diff` and `D` commands in Maple.

- Use the `diff` command to find the following derivatives. Write down the command used, the output from Maple, and then the notation we would normally use for the expression (if different).

Problem	Maple Command	Maple Output	Standard Math Notation
(a) $\frac{d}{dx} \frac{1}{\sqrt{x}}$	> _____	_____	_____
(b) $\frac{d}{dt} \sin^3 t$	> _____	_____	_____

- Use the `D` operator to evaluate the following derivatives. Give the Maple commands to (i) define the function, (ii) compute the exact value of the derivative at the given point, and (iii) convert the exact result into a floating point (decimal) approximation. Give both the exact and floating point results.

(a) $\frac{d}{dx} \sin(\sin x) \Big _{x=\frac{\pi}{3}}$	> _____	_____
	> _____	_____
	> _____	_____
(b) $\frac{d^2}{dx^2} \sin 2x \Big _{x=\frac{\pi}{6}}$	> _____	_____
	> _____	_____
	> _____	_____

- Use Maple to find the absolute maximum and minimum values of $f(x) = \frac{x+1}{x^2+3}$ on the closed interval $[0, 2]$. Write down the sequence of Maple commands you use to solve the problem as well as the maximum and minimum values.