

Name: *Solution*

Student Number:

Problem 1

Find the local maximum and minimum values of f using the First Derivative Test.

$$f(x) = x^4 - 2x^2 + 3$$

$$\begin{aligned} f'(x) &= 4x^3 - 4x \\ &= 4x(x^2 - 1) \\ &= 4x(x-1)(x+1) \end{aligned}$$

Find critical numbers.

$$\begin{aligned} f'(x) &= 0 \\ 4x(x-1)(x+1) &= 0 \\ x &= 0, x=1, x=-1 \end{aligned}$$

	-1	0	1
f'	-	+	-
f	↘	↗	↘ ↗

local min values: $f(-1) = 2$
 $f(1) = 2$

local max value: $f(0) = 3$