

Name: *Solution*

Student Number:

Problem 1

Find the absolute maximum and absolute minimum values of f on the given interval.

$$f(x) = 2x^3 - 3x^2 - 12x + 1, \quad [-2, 3]$$

$$(1) \quad f(-2) = 2(-8) - 3(4) + 12(2) + 1 = -3$$

$$f(3) = 2(27) - 3(9) - 12(3) + 1 = -8$$

$$(2) \quad f'(x) = 6x^2 - 6x - 12$$

$$= 6(x^2 - x - 2)$$

$$= 6(x - 2)(x + 1)$$

Critical numbers: $x = 2$ and $x = -1$

$$(3) \quad f(-1) = 2(-1) - 3 - 12(-1) + 1$$
$$= -2 - 3 + 12 + 1 = 8$$

$$f(2) = 2 \times 8 - 3 \times 4 - 12 \times 2 + 1$$
$$= 16 - 12 - 24 + 1$$
$$= -19$$

(3) Absolute Max. Value is $f(-1) = 8$ Absolute Min Value is $f(2) = -19$