First Name: ___________________________ Last Name: ___________________________
Student-No: ___________________________ Section: ___________________________

Grade: 

The remainder of this page has been left blank for your workings.
Very short answer questions

1. 2 marks Each part is worth 1 marks. Please write your answers in the boxes.
   (a) Compute \( \lim_{x \to 4} \frac{x^2 - 16}{x - 4} \).

   Answer:

   (b) Find all values of \( x \) where \( f(x) = \frac{\sqrt{3 - x}}{(x + 2)(x - 8)} \) is continuous. Give your answer in interval notation.

   Answer:
Short answer questions — you must show your work

2. 4 marks Each part is worth 2 marks.

(a) Compute \( \lim_{x \to \infty} \frac{3x^2 + 7}{\sqrt{4x^4 + 10x^3 + 1}} \).

Answer:

(b) Can you use the Intermediate Value Theorem to conclude that the polynomial \( f(x) = x^4 + 2x^2 - 1 \) has a root in the interval \([-1, 1]\)? Write “yes” or “no” in the answer box, and justify your answer.

Answer:
Long answer question — you must show your work

3. [4 marks] Compute the limit \( \lim_{x \to 8} \frac{\frac{1}{\sqrt{x+1}} - \frac{1}{3}}{x - 8} \).

Answer: