

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

ASSIGNMENT 2

MATH 2000

FALL 2018

Due: Friday, September 28th, 2018 by 2:00pm. SHOW ALL WORK.

Note: You should complete the worksheets for Sections 1.2 (question 1 only) and 2.2 before you work on this assignment.

1. Use the basic properties of convergent sequences and results regarding limits of common sequences to evaluate the limit, if it exists, of each of the following sequences $\{a_i\}$. If a sequence is divergent, explain why.

(a) $a_i = \frac{8i^2(3i - 5)}{i(6i + 1)(2i - 3)}$

(b) $a_i = \frac{2^{4i-1}}{3^{3i+2}}$

(c) $a_i = \frac{3^{2i+1} + 6^i}{5 - 7^{i+2}}$

(d) $a_i = (-1)^i \frac{i}{3^i(i + 1)^2}$

2. Evaluate each of the following limits, or show that the limit does not exist.

(a) $\lim_{(x,y) \rightarrow (4,8)} \frac{2y - x}{x^2 - 2xy - 3x + 6y}$

(b) $\lim_{(x,y) \rightarrow (8,4)} \frac{2y - x}{x^2 - 2xy - 3x + 6y}$

(c) $\lim_{(x,y) \rightarrow (-3,1)} \frac{x + 4y - 1}{3y - 2x - 9}$

(d) $\lim_{(x,y) \rightarrow (0,0)} \frac{7xy^2}{x^2 + y^4}$