Math 130 04 – A Survey of Calculus

Homework assignment 4

Due: Tuesday, September 27, 2022

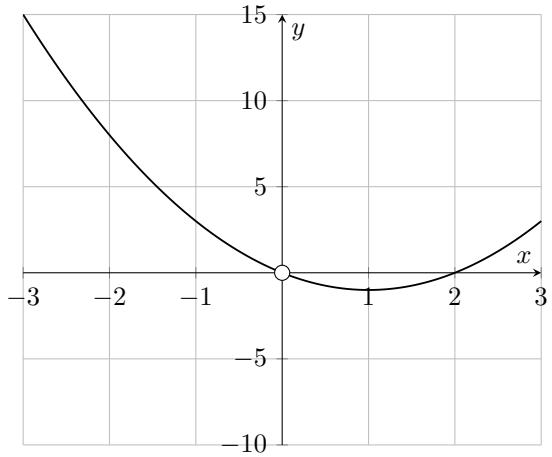
Instructions: Write your answers on a separate sheet of paper. Write your name at the top of each page you use, and number each page. Number your answers correctly.
Justify all your answers.

1. Evaluate the following limits, justifying your answers each time.

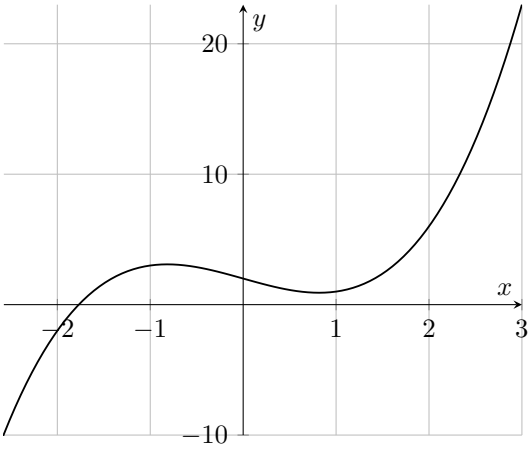
   (a) $\lim_{x\to 4} \dfrac{x^3 - 9x^2 + 16}{3x^2 - 9x + 12}$ (b) $\lim_{x\to\infty} \dfrac{x^3 + 25}{x^3 + 13}$ (c) $\lim_{x\to 0} \dfrac{x+3}{x^2}$

2. Which of the following graphs represent a function continuous over the interval $(-1, 1)$? Justify your answers.

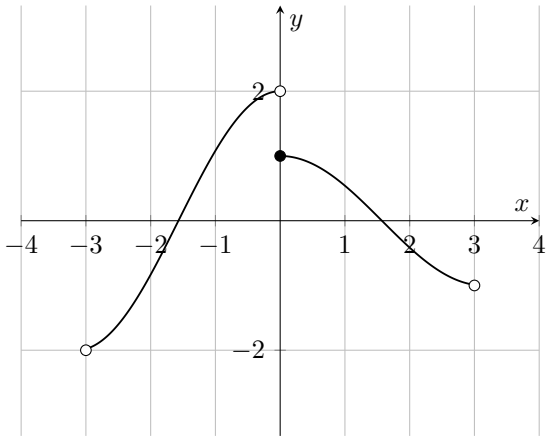
(a)



(b)



(c)



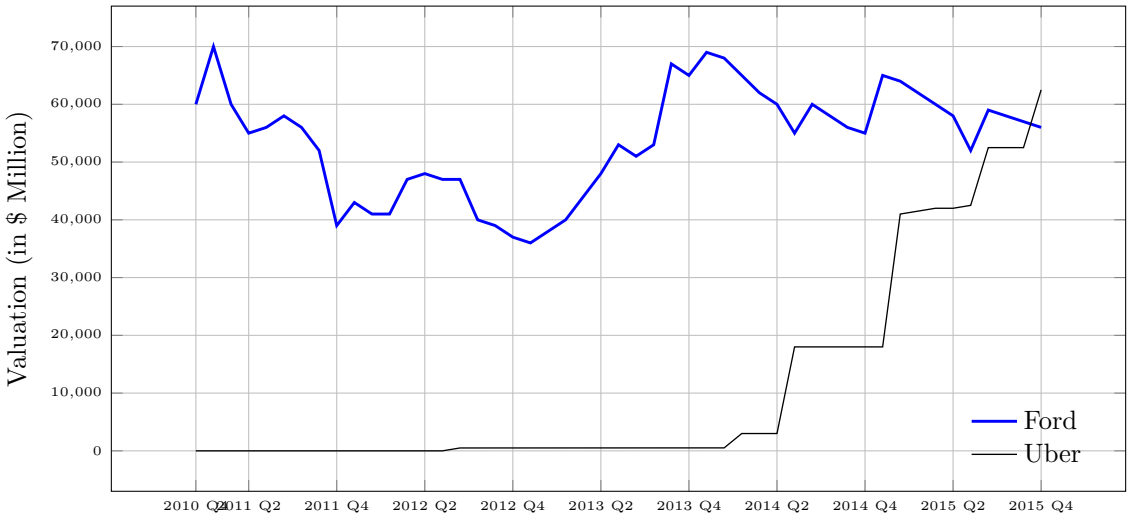


Figure 1: Valuation of Uber and Ford. (Source: Forbes)

3. The figure shows the valuation of the companies Ford and Uber between 2011 and 2015.
   (a) Are the graphs continuous functions in the interval (2014 Q2, 2015 Q4)?
   (b) Is there a point between 2014 Q2 and 2015 Q4 where:
      i. Ford's valuation equals that of Uber?
      ii. Ford's valuation is five times that of Uber?

   Justify all your answers.