Revision. The problems on §14.8 are due December 3. All other problems are due November 24.

(1) In the textbook:

§14.7) 4, 9, 16, 19, 34, 41, 54.
Read (but you don’t have to do): 37, 38, 55.

§14.8) 3, 5, 9, 23, 29.

(2) Some more practice with limits...

• Use polar coordinates to compute
  \[ \lim_{(x,y) \to (0,0)} \frac{x^3y + x^2y^2}{x^2 + y^2}. \]

• Use polar coordinates to compute
  \[ \lim_{(x,y) \to (3,4)} \frac{(x-3)^2(y-4)}{\sqrt{(x-3)^2 + (y-4)^2}} \]
  Hint: first substitute \( u = x - 3 \), \( v = y - 4 \).

• Use the “approaching from various directions” technique to show that
  \[ \lim_{(x,y) \to (2,5)} \frac{(x-2)(y-5)}{(x-2)^2 + (y-5)^2} \]
  does not exist.

• Does
  \[ \lim_{(x,y) \to (-1,1)} \frac{x^2 - y^2 + 2x + 2y}{x^2 + 2x + 1 + y^2 - 2y + 1} \]
  exist? Why or why not?

(3) ... and continuity:

• Define a function
  \[ f(x, y) = \begin{cases} 
  \frac{x^2}{\sin(y)} & \text{if } y \text{ is not a multiple of } \pi \\
  0 & \text{if } y \text{ is a multiple of } \pi.
  \end{cases} \]
  At what points is \( f \) continuous? Discontinuous?

• Define a function
  \[ f(x, y) = \begin{cases} 
  x^2/y & \text{if } y \neq 0 \\
  0 & \text{if } y = 0.
  \end{cases} \]
  At what points is \( f \) continuous? Discontinuous?
If you had trouble with | Do problems
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14.7.4 | 14.7.1–3
14.7.9, 16 | 14.7.5–18
14.7.19 | 14.7.20
14.7.34 | 14.7.29–36
14.7.41 | 14.7.39–51
14.7.54 | 
14.8.3, 5, 9 | 14.8.1–17
14.8.23 | 14.8.24
14.8.29 | 14.8.40–42

E-mail address: rl2327@columbia.edu