MAT 319 HOMEWORK–9 DUE AT THE BEGINNING OF CLASS ON WEDNESDAY, NOVEMBER 14

One goal for this course is for you to develop your skill in effectively communicating mathematics. With this in mind, you should clearly write up your solutions. Solutions with little or no justification will receive little or no credit. Clear, organized, partially correct work may receive partial credit.

(1) Determine whether the following limits exist, state the limit if it exists, and prove your results.

(a)
$$\lim_{x\to 0} \frac{x^2}{|x|}.$$

(b)
$$\lim_{x\to 0^+} \frac{1}{x}.$$

(c)
$$\lim_{x\to 0^+} \sin\frac{1}{x}.$$

(d)
$$\lim_{x\to 0^+} x\sin\frac{1}{x}.$$

(2) Determine the following limits:

(a)
$$\lim_{x\to 0} \frac{\sqrt{4+x}-2}{x}.$$

(b)
$$\lim_{x\to 0} \frac{x^2+4x}{x^2+2x}.$$

(c)
$$\lim_{x\to a} \frac{x^3-a^3}{x-a}.$$