

## SUPPLEMENTAL PROBLEMS - PRECALCULUS REVIEW

Some problems on this sheet are taken from *Calculus*, sixth edition by Larson, Hostetler, et al. New York: Houghton Mifflin, 1998.

- Graph on TI-89 and state domain and range:  $y = \begin{cases} |x| & x \leq 0 \\ \sin x & x > 0 \end{cases}$
- Graph  $f(x) = (1+x)^{1/x}$  and explain the behavior of the function on each of the following:  $x < -1$ ,  $x = -1$ ,  $-1 < x < 0$ ,  $x = 0$ , or  $x > 0$ .
- Evaluate graphically:  $\lim_{x \rightarrow 1} f(x)$  where  $f(x) = \begin{cases} |x| - 2 & x < 1 \\ x^2 - 3x & x \geq 1 \end{cases}$
- Sketch graphs by hand. Check on TI-89:
  - $y = 2 - x$  and  $y = \sqrt{2 - x}$
  - $y = x^2 - 16$  and  $y = \sqrt{x^2 - 16}$
  - $y = (2 - x)(x - 5)^2$  and  $y = \sqrt{(2 - x)(x - 5)^2}$

## Answers

- Domain is all real numbers. Range is  $[-1, \infty)$
- Here is a partial answer: The function is undefined on  $(-\infty, -1)$  since the base of the exponent would be negative. The function is well defined for  $x > 0$ .