

Show all work, including mental steps, in a clearly organized way that speaks for itself. Use proper mathematical notation, identifying expressions by their proper symbols (introducing them if necessary), and use EQUAL SIGNS and arrows when appropriate. Always SIMPLIFY expressions. BOX final short answers. LABEL parts of problem. Keep answers EXACT (but give decimal approximations for interpretation). Indicate where technology is used and what type (Maple, GC).

1. Sketch the region between  $y = 4 - x^2$  and  $y = 0$  and find its area exactly and numerically to 5 significant digits. [In your sketch, be sure to label the axes and appropriate tickmarks, and the curves you plot.]
2. Water flows from the bottom of a storage tank at a rate of  $r(t) = 200 - 4t$  liters per minute, where  $0 \leq t \leq 50$ . Find the amount of water that flows from the tank during the first 10 minutes. Complete your solution with an English sentence stating the result of the word problem. [Can you think of why the time range domain for the formula is chosen? Explain.]

► **solution**