SOLUTIONS

1. Show why each of the following properties of the definite integral is true, first in terms of net change in amount (use a velocity-position example) and then in terms of area under a curve.

   (a) If k is a constant, then $\displaystyle\int_a^b kf(x)\,dx = k\int_a^b f(x)\,dx$.

   See Section 22.4 in your textbook.

   (b) If $f(x) \le g(x)$ for all x in the interval $[a,b]$, then $\displaystyle\int_a^b f(x)\,dx \le \int_a^b g(x)\,dx$.

   (c) $\displaystyle\int_a^c f(x)\,dx = \int_a^b f(x)\,dx + \int_b^c f(x)\,dx$