MA 160
Section 1.2 Combining Functions

A company's **profit function** is defined as revenue minus cost.

1. A company's annual revenue, in millions of dollars, is given by the function $R(t) = 0.2t^2 + 3t + 5$, where t is defined as years since 2000. The company's annual cost, in millions of dollars, is given by the function $C(t) = 4t + 9$.

a) Find and simplify a formula for the profit function $P(t)$.

b) Compute and interpret $P(7)$.

2. Let $f(x) = x^2$. The function $g(x)$ is unknown. Find

a) $f(6)$ b) $f(-6)$ c) $f(\text{☺})$ d) $f(x-3)$ e) $f(g(x))$

3. Let $f(x) = \sqrt{x}$ and let $g(x) = x^2 + 1$. Find

a) $f(25)$ b) $f(-25)$ c) $f(\text{☺})$ d) $f(x-3)$ e) $f(g(x))$

Given two functions *f* and *g*, the **composition** of *f* and *g* is $h(x) = f(g(x))$. This is what you just did in question 3, part e).

4. Suppose $L(t) = 2t - 1^3$. Can you **decompose** $L(t)$ by writing it as composition of two functions *f* and *g*? Which function would you consider the "inside" function and which function would you consider the "outside" function?

Before beginning the homework for section 1.2, please study example 4 on p. 20.