

Assignment 5: Optional (part 1)

1. You work forty hours a week at a furniture store. You receive a \$220 weekly salary, plus a 3% commission on sales over \$5000. Assume that you sell enough this week to get the commission. Given the functions $f(x) = 0.03x$ and $g(x) = x - 5000$, which of $(f \circ g)(x)$ and $(g \circ f)(x)$ represents your commission?
2. You make a purchase at a local hardware store, but what you've bought is too big to take home in your car. For a small fee, you arrange to have the hardware store deliver your purchase for you. You pay for your purchase, plus the sales taxes, plus the fee. The taxes are 7.5
 - (i) Write a function $t(x)$ for the total, after taxes, on the purchase amount x . Write another function $f(x)$ for the total, including the delivery fee, on the purchase amount x .
 - (ii) Calculate and interpret $(f \circ t)(x)$ and $(t \circ f)(x)$. Which results in a lower cost to you?
 - (iii) Suppose taxes, by law, are not to be charged on delivery fees. Which composite function must then be used?
3. Your computer's screen saver is an expanding circle. The circle starts as a dot in the middle of the screen and expands outward, changing colors as it grows. With a twenty-one inch screen, you have a viewing area with a 10-inch radius (measured from the center diagonally down to a corner). The circle reaches the corners in four seconds. Express the area of the circle (discounting the area cut off by the edges of the viewing area) as a function of time t in seconds.