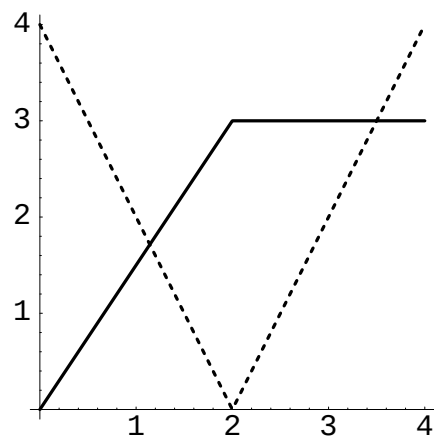


1. Consider the graphs of $f(x)$ (the solid curve) and $g(x)$ (the dashed curve) in the figure to the right. If $h(x) = g(f(x))$ and $v(x) = g(g(x))$, find (3 points)
- $h'(1)$
 - $v'(3)$



2. Suppose that the function $y = 3^{(-ax^2)}$ (with $a > 0$) is concave down for $-1 < x < 1$. What is a ? You should use your penetrating knowledge of derivative short-cuts in the course of solving this problem. (4 points)

3. Suppose that students' ecstasy about being in calculus, E , is given (in deleriums, the standard unit for ecstasy) by $E(t) = \frac{1}{1+\cos(\frac{\pi t}{3})}$, where t is the number of weeks since the start of the semester. At what rate is the students' ecstasy changing seven weeks into the term? Three weeks into the term? Explain why these two values make sense by referring to the function $E(t)$. (3 points)