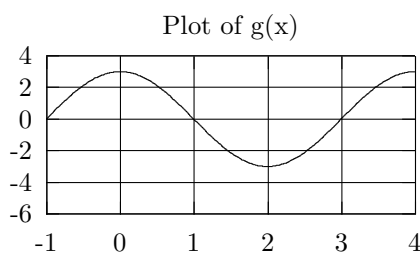
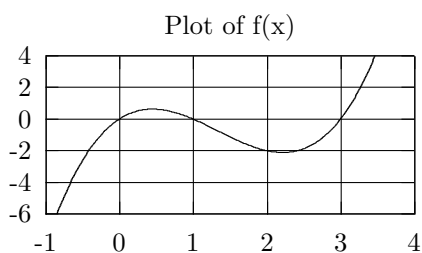


These are only a few sample problems to *help* you prepare for the exam. You should also be certain that you completely understand the assigned homework, in-class work, and your class notes.

1. Let $f(x) = 3x^4 + 4x^3 - 12x^2 + 2$.
 - (a) Find the maximum and minimum values of $f(x)$ on the interval $[-3, 2]$. What are the x -values where these occur?
 - (b) Find the maximum and minimum values of **the slope** of $f(x)$ on the interval $[-3, 2]$. What are the x -values where these occur?
2. Why do we use radians to measure angles rather than degrees?
3. Below are the graphs of $f(x)$ and $g(x)$. Let $h(x) = x^3 f(x)$, $k(x) = f(x)g(x)$, and $m(x) = (g(x))^2$.



- (a) Is h increasing or decreasing at $x = 1.5$?
 - (b) Is h concave up or concave down at $x = 3$?
 - (c) Find all stationary points of m .
 - (d) Is k increasing or decreasing at $x = 2$?
 - (e) If H is an antiderivative of h , is H increasing or decreasing at $x = 2$?
4. Is $x = 0$ an inflection point of $f(x) = \sin(\cos(x^2))$?
 5. Find an *antiderivative* of each of the following functions.
 - (a) $f(x) = e^{x^2} 2x \cos(x) - e^{x^2} \sin(x)$
 - (b) $h(x) = -\sin(x) \sec(\cos(x))^2$
 6. A rectangle has its base on the x -axis and its upper two vertices on the parabola $y = 12 - x^2$. What is the largest area the rectangle can have?
 7. Let $f(x) = e^x$ and $x_0 = 0$.
 - (a) Find $P_5(x)$, the fifth degree Taylor polynomial for $f(x)$ at $x_0 = 0$.
 - (b) Use $P_5(x)$ to find an approximate value for e .
 8. Evaluate each limit by recognizing it as the definition of a derivative.
 - (a) $\lim_{h \rightarrow 0} \frac{\cos(7+h) - \cos(7)}{h}$
 - (b) $\lim_{h \rightarrow 0} \frac{2^{1+h} - 2}{h}$
 9. Be sure to review all of the assigned homework problems, and *pay attention to any types of problems that may not be represented here*.