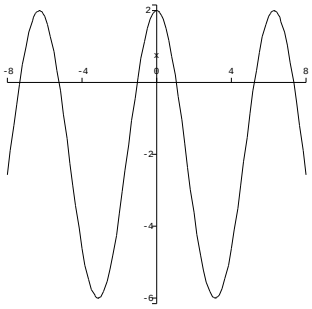
These are only a few sample problems to *help* you prepare for the exam. You should also be certain that you completely understand the assigned homework, in-class work, and your class notes.

1. Consider the graph shown below:

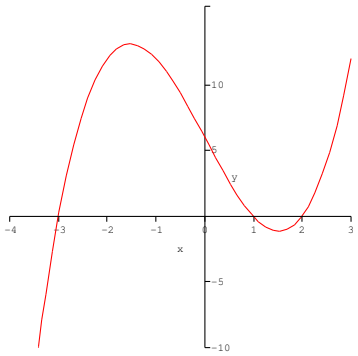


   (a) Find values A and D so that this is the graph of $y = A\cos(x) + D$.

   (b) Find values A, C, and D so that this is the graph of $y = A\sin(x + C) + D$.

2. Let f be a function whose derivative exists everywhere, and let $g(x) = f(x - 4) + 7$. Explain how the graphs of f and g are related. How are the graphs of f' and g' related?

3. Below is the graph of f'.



   (a) On which intervals is f increasing? decreasing?

   (b) Where does f have stationary points? Local maxima? Local minima?

   (c) Where is f concave up? concave down?

   (d) Where does f have inflection points?

   (e) Suppose that $f(0) = 1$. Sketch a graph of $y = f(x)$.

   (f) Suppose that $f(0) = 1$. Write the equation of the line tangent to the graph of $y = f(x)$ at $x = 0$.

4. Now suppose that the graph given in the previous problem is the graph of g''.

   (a) If $g'(1) = 50$, is g increasing or decreasing at $x = 2$? Why?

   (b) If $g'(0) = -1$, is g increasing or decreasing at $x = -1$? Why?

5. Let $f(x) = 2x^3 - x^2 - 8x + 7$. Find the *exact* values of the local maxima, local minima, and inflection points of $f(x)$.

6. Let $g(x) = \sqrt[3]{x}$. Find the equation of the tangent line to the graph of $y = f(x)$ at $x = 8$ and use this to approximate $\sqrt[3]{8.10}$.

7. Find all values of x that solve each equation. Give exact values (e.g. $x = \ln(\frac{17}{38\pi})$) rather than decimal approximations.

   (a) $70 = 5e^{0.3x}$

   (b) $\log_3(x + 17) + \log_3(4) = \pi$

   (c) $-2\cos(\sqrt{x}) = \sqrt{3}$ where $0 \le x \le 2\pi$

8. Be sure to completely understand the assigned homework problems from Sections 2.1 and 2.2 that are not collected.