Math 100
Review Problems
November 14th, 2007

1. Find slope-intercept equations for the following lines.
   (a) The line that passes through \((-5, 7)\) and is parallel to the line \(y = 3x - 4\).
   (b) The line that is perpendicular to the \(y\)-axis and passes through the point \((-2, 3)\).

2. Find the \(x\)- and \(y\)-intercepts of the line \(y = 4x - 8\).

3. Find the natural domains of the following functions.
   (a) \(f(x) = \sqrt{4 - x^2}\)
   (b) \(f(x) = \frac{1}{2 - x}\)

4. Express the function \(f(x) = |x + 2| + 3\) in piecewise form and sketch its graph.

5. (a) Describe the sequence of shifts and reflections needed to transform the graph of \(y = \sin(x)\) into the graph of \(y = 4 - \sin(x + \pi)\).
   (b) Sketch the graph of \(y = 4 - \sin(x + \pi)\).

6. Solve the inequality \((x - 3)(5 - x) \geq 0\). Express the answer in interval notation.

7. Solve the inequality \(\frac{x}{x - 4} < 0\). Express the answer in interval notation.

8. Let \(f(x) = 2 - 4x^2 + x\). Evaluate the following:
   (a) \(f(-1)\)
   (b) \(f(0)\)
   (c) \(f(3 + a)\)
   (d) \(f(x + h)\)
9. Let $f(x) = x^2 - 9$ and $g(x) = 4x + 1$. Evaluate the following:

(a) $(f \circ g)(x)$

(b) $(g \circ f)(x)$

10. For each function $h$, find $f(x)$ and $g(x)$ so that $h(x) = (f \circ g)(x)$.

(a) $h(x) = \sin(x^3 + 7)$

(b) $h(x) = \sqrt{4 + x}$