Fall 2013
Kronenthal

Name: _____

Math 181 Section 050
Review Worksheet
August 26, 2013

Directions: These problems are designed to remind you of a few of the concepts you should have seen in an algebra or Precalculus course. Relax, try your best, and **be sure to get help with any problems you have trouble with, preferably before Friday's quiz.** The sections listed below correspond to those at the back of your textbook.

Whenever you are asked to draw a graph, be sure to indicate an appropriate scale on the axes so that key features of the graph are apparent.

Appendix A (towards the back of your book)

1. Simplify $||-3|-|-7||$

2. Evaluate -9^2

3. Evaluate $(x^2)^3$

4. Simplify x^3x^7

5. Put $(2x-3)(x^2-3x+5)$ in standard form (i.e. the terms should be ordered from largest power of x to smallest power of x).

6. Factor $3x^2-x-2$

7. Factor x^2+64

8. Find all solutions to the equation $x^2+7x+4=0$.

9. Simplify $\frac{x^2-4}{x} \div \frac{x+2}{x-2}$

10. Simplify $\frac{3}{x+4}+\frac{6}{x+5}$

11. Simplify $\sqrt{-11^2}$

12. Simplify $32^{-\frac{4}{5}}$

13. Find an equation of the line through the points $(6, 5)$ and $(-1, 4)$

14. Find an equation of the line through the point $(5, 6)$ and perpendicular to the line $5x + 2y + 20 = 0$.

15. Find the equation of the circle with center $(-2, 3)$ passing through the point $(1, 4)$.

1.1 Review of Functions

1. Using interval notation, determine the domain and range of the function $f(x) = \sqrt{4 - x^2}$.

2. Let $f(x) = x^3 + 2$ and $g(x) = |x|$. Determine $(f \circ g)(x)$, and $(g \circ f)(x)$.

3. Simplify the difference quotients $\frac{f(x+h)-f(x)}{h}$ and $\frac{f(x)-f(a)}{x-a}$, where $f(x) = \frac{2}{x}$.

1.2 Representing Functions

1. Carefully sketch a graph of the function

$$f(x) = \begin{cases} 2x+1 & x \leq 0 \\ \sqrt{x}-1 & x > 0 \end{cases}.$$

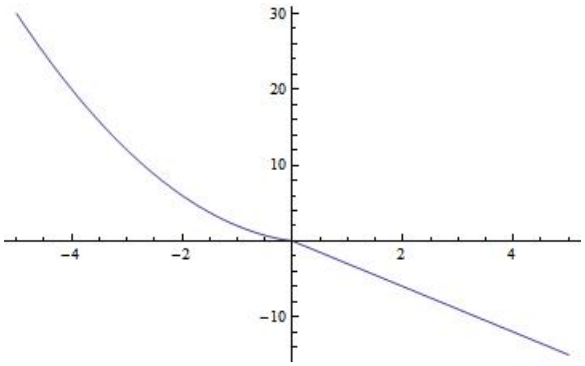
2. Carefully sketch a graph of the function $g(x) = (x+4)^2 + 3$ by first sketching $y = x^2$ and $y = (x+4)^2$.

1.3 Inverse, Exponential, and Logarithmic Functions

1. Does the function $f(x) = -(6-x)^3$ have an inverse? If so, find it. If not, find a domain on which it does.

2. Does the function $f(x) = \frac{3}{x^2-2}$ have an inverse? If so, find it. If not, find a domain on which it does.

3. Graph the inverse of the following function:



4. Solve $\log_4 x = 3$.

5. Solve $\log_b 81 = 4$.

6. Solve $3^{3x-4} = 15$; simplify your answer as much as possible.

7. Carefully sketch a graph of the function $f(t) = \ln t$.

8. Carefully sketch a graph of the function $g(t) = e^t$.

9. Explain how the functions f and g from the previous two exercises are related.

1.4 Trigonometric Functions and Their Inverses

1. For each of the following, if the given trigonometric function is defined as the product or quotient of more "elementary" trigonometric functions, include this definition and intermediate steps in your solution.

   (a) $\cos\left(\frac{\pi}{3}\right) =$

   (b) $\sin\left(\frac{3\pi}{2}\right) =$

   (c) $\tan\left(\frac{5\pi}{6}\right) =$

   (d) $\csc\left(\frac{5\pi}{3}\right) =$

   (e) $\cot\left(\frac{5\pi}{4}\right) =$

   (f) $\sec\left(\frac{13\pi}{6}\right) =$

2. $\sin^{-1}(1/2) =$

3. $\cos^{-1}(-1/2) =$

4. $\sin^{-1}\left(\sin\left(\frac{4\pi}{3}\right)\right) =$

5. Sketch the functions $f(x) = \cos(x)$, $g(x) = \sin(x)$, and $h(x) = \tan(x)$ on the interval $[-2\pi, 2\pi]$.

6. Sketch the functions $f(x) = \arccos(x)$ and $g(x) = \arcsin(x)$ on appropriate (and possibly different) domains.

7. Simplify $\cos(\tan^{-1}(x))$. Hint: Draw a right triangle.