Math 210 Problem set 1 (due 1/15/10)

Remember your algebra? Geometry? Trigonometry? Simplify the following as much as possible (without your calculator). Turn in on a separate sheet of paper:

Problem 1

$$(x-3)^2$$

Problem 2

$$\left(-c\sqrt{98}\right)^2$$

Problem 3

$$\frac{c^9}{c^{14}}$$

Problem 4

$$\log_{10}(1000)$$

Problem 5

$$\sqrt{x^2+9}$$

Problem 6

$$\log_2(a+b)$$

Problem 7 *If* $\log_a(b) = c$ *and* $\log_a(c) = d$*, find*

$$\log_a(bc^2).$$

Problem 8 *Solve*

$$(x-3)(2x+50) = 0.$$

Problem 9 *Solve*

$$x(x+2) = 3.$$

Problem 10 *Sketch the region in the plane described by*

$$2 < y \leq x.$$

Problem 11 *Find all values of* x *for which*

$$\sin x = 0.$$

Note that there are many, many such values. Choose radians or degrees, but you must specify your answer in such a way that indicates which unit you used.

Problem 12 *How many radians is 110 degrees? (An expression involving* π *is fine).*

Problem 13 *Suppose* θ *is an angle so that* $\sin\theta = w$*. Find* $\cos\theta$*,* $\tan\theta$*,* $\sec\theta$*, and* $\csc\theta$*. Your answer will involve* w*. Note that for some of these, there may be more than one answer.*

Problem 14 *Solve the following equation for* y*:*

$$3x + 8x^3 + \frac{8}{3x}y = 7$$

Problem 15 *Find the slope of the line that passes through the points* $(2,3)$ *and* $(5,12)$*.*

Problem 16 *Find the equation of a line that passes through the point* $(3,5)$ *and has slope* -8*.*

Problem 17 *Find the area of a right triangle with sides of lengths 5, 3, and 4.*

Problem 18 *Find the area of a circle centered around the point* $(2,3)$ *so that the point* $(5,7)$ *is on (the edge of) the circle.*