0C1/1C1 TAKE HOME TEST 1, 2011

This homework is to be handed in by **Monday 24th October** 2011, to the Foundation Year Office between 12.00 and 1.00 for 0C1 students and either to me at a lecture or into the envelope on my office door (ATB, room 2.206) for 1C1 students.

Submit your answers on A4 paper printing your full name and course (0C1 or 1C1) clearly at the head of each page. This homework will be marked and returned to you. The mark awarded will contribute towards the end of semester examination in January 2012. For details of the marking regime see the *MATHFS541 0C1/1C1 Course Notes* on these web pages.
In answering these questions you should show your working. The use of calculators in this test (and the January exam) is banned.

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1. Evaluate the following using the rules and conventions described in the lectures. Express the results as integers or fractions (that is in the form $\frac{p}{q}$ where p is an integer and q is a natural number) in the simplest form.

   (a) $16/(15-3)-2$ (b) $(15-23)/2^2$
   (c) $(7/4)-5\times(1/3)$ (d) $(4-(2-7))/((5-(9+14))$

2. Multiply out the brackets in the following and collect terms where appropriate.

   (i) $(a-b)(c-a)$ (ii) $(x+y)(x-1-y)$
   (iii) $(1-x)(2x+1)(1+x)$ (iv) $(q-p)(q-(p-1))$

   (v) What is the term in x in (iii) ?

   (vi) What is the coefficient of x^2 in (iii) ?

3. Put the following expressions in the form $a^m b^n$ where m, n are fractions or integers.

   (i) $\dfrac{a^3b^5}{a^7b^2}$ (ii) $\left(\dfrac{b^{1/3}}{ab^{-3/4}}\right)^{-1}$

4. Express the following in terms of $\log u, \log v$ and $\log w$

   (i) $\log((uv)/w)$ (ii) $\log\left(\sqrt{u^{-3}v^{4/3}}\right)$

5. Given that $a = \log_2(3)$ express $\log_8(3)$ in terms of a.