MATH1040/7040 Assignment 1

All questions should be submitted by 4pm on Friday March 18th. Assignments can be submitted at your tutorial, or to the MATH1040/7040 assignment boxes (4th floor Priestley Building #67). **Make sure that your name, student number, tutorial group and your tutor's name are on each sheet of your answers**. You do not need a cover sheet nor do you need to include the question sheet. Solutions will be distributed in class later.

1. Describe your mathematical history, for example, did you like maths at school, what did you find easy/difficult etc. Also write about what you want to get out of this course. Write at least six (6) lines.

2. Answer each of the following questions, showing all working.

(a) Simplify $\left(\frac{10}{8} - \frac{-32}{-40} + \frac{-31}{40}\right) \times \frac{-32}{-48}$

(b) Simplify $y^3 \times x^2 y^3 x^{-1} y^1 \div x^2$

(c) Expand and simplify $(6 - 6x)(-3x)$

(d) Expand and simplify $(4 + x)(-6 + 5x)$

(e) Determine x, if $-4 = \frac{4x}{5} - 5$

(f) Determine y, if $\frac{-3}{-2y} + 6 = 5$

3. Insert mathematical operator(s) (that is, $+, -, \times, \div$) and/or a set of brackets in each of the following in order to make the statement true:

(a) $-4 = 4 \quad 2 \quad 4$

(b) $5 \quad 10 \quad 2 = 1$

(c) $6 \quad 2 \quad 3 \quad 4 = 16$

4. Evaluate the following:

(a) $5 \times \sqrt{55 - 30 \div 5} - 4^3 \div 8$

(b) $45 + 5 \times \frac{(2^3 + 2^2) \times 3^2}{5^3 - (3 + 2)}$

(c) $(45 \times 3^{-2} + \sqrt{25})^{-3} \times 10^5 \div 2^2$.

5. Roughly estimate the number of jugs of water it would take to fill a party balloon.

6. Diophantus of Alexandria was a famous mathematician who lived in Egypt during the 3rd century. While he made many contributions to mathematics, one modern use of his work is Diophantine equations. These are usually algebraic equations with integer coefficients, for which integer solutions are sought. A Diophantine problem is as follows: Beautiful Bob made some three-legged stools while Fearless Fred made some four-legged ones. Together they used 37 legs. Write an equation for how many three- and four-legged stools they could have made. How many solutions are there and what are they?

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