MATH1040/7040 Assignment 2

All questions should be submitted by 4pm on Friday March 25th. 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. How are you finding the course so far? What are you finding difficult? Write a few lines.

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

(a) Find y, if $|2y + 4| = 4$

(b) Simplify $\dfrac{8z^{-2}z^{-3}}{z^{-1}z^{-3}}$

(c) Simplify $y^{-1}x^0x^{-2}x^1 \times y^2 \div x^{-1}$

(d) Find y if $\sqrt{8} = y\sqrt{2}$

(e) Expand and simplify $\left(\sqrt{6} + \sqrt{7}\right)\sqrt{6}$

(f) Expand and simplify $\left(\sqrt{6} + \sqrt{4}\right)\left(\sqrt{6} + \sqrt{6}\right)$

(g) Find $|-33|$

(h) Write $-3 \leq x < -2.5$ in interval form and mark it on a real line.

(i) Write the interval $(-1, 3]$ using inequality signs and mark it on a real line.

(j) Solve $-2x - 3 \leq 3x - 18$, then write your answer in interval format and mark it on a real line.

3. Choose three consecutive numbers, e.g. 5, 6, 7. Square the middle number: $6^2 = 36$. Multiply the other two numbers: $5 \times 7 = 35$. Subtract these results: 36 - 35 = 1! Does this always work? Prove your results using algebra, not by testing particular numbers. (Hint: let the middle number be n.)

4. The number of chirps that a cricket makes in one minute is a function of the temperature. As a result, it is possible to tell roughly how warm it is by using a cricket as a thermometer! A formula for temperature is: $t = \dfrac{n}{8} + 6$, where t represents the temperature in degrees Celsius, and n represents the number of cricket chirps in one minute.

(a) **(i)** If you hear 120 chirps per minute, what is the approximate temperature?
(ii) At what temperature do the crickets stop chirping?

(b) Famous chef Pierre le Frog has one speciality, Tepid Cricket Soup (which he serves with fava beans and a nice Chianti). Each bowl of soup contains ten crickets and is served at a temperature of 30° Celsius. Pierre knows the soup temperature by counting the total number of cricket chirps per minute. What is the total number of chirps per minute if a bowl of soup is to be served at exactly 30°?

Ensure your name, student number, tutorial number and tutor's name are on each sheet of your answers.