

**Mathematics 1100Y – Calculus I: Calculus of one variable**

TRENT UNIVERSITY, Summer 2012

**Assignment #6**

**Solving equations with Maple**

*Due on Wednesday, 27 June, 2012.*

Recall that  $\sinh(x) = \frac{e^x - e^{-x}}{2}$ . Its inverse function is often denoted by  $\operatorname{arcsinh}(x)$ .

1. Give a derivation of an expression for  $\operatorname{arcsinh}(x)$  in terms of powers, roots, and the natural logarithm function. When does this expression make sense? [5]

HINT: This amounts to solving the equation  $x = \sinh(y) = \frac{e^y - e^{-y}}{2}$  for  $y$ .

NOTE: You may not look up the answer for question 1.

2. Use **Maple** to find an expression for  $\operatorname{arcsinh}$  in terms of powers, roots, and the natural logarithm function. If it is different from the expression you obtained in answering 1, do the two expressions really amount to the same thing or not? [5]

HINT: **Maple** has a command called **solve** ...