Consider the two pair of problems.

- SORTING: *Given a set of n integers, the task is to sort the integers in increasing order.*
- CONVEXHULL: *Given a set X of n 2-dimensional points, the task is to compute the smallest convex set (i.e. a set that can be formed by joining line segments) that contains all of the points in X.*

(a) Show that there exist a linear-time reduction from SORTING to CONVEXHULL.

(b) Hence, deduce that any algorithm which solves CONVEXHULL has an $\Omega(n \log n)$ lower bound.

This means that, in the worst case, an algorithm such as Graham scan and Monotone chain is tight.

Rubric.

- This task will form part of the portfolio.
- Ensure that your argument is clear and keep reworking your solutions until your lab demonstrator is happy with your work.