

# MTH 4320 Homework 7

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## Problem 1

*Solution.* We run Prim's algorithm to find a minimum spanning tree (MST) of the graph with root  $d$  then the edges added to the MST are  $\{d, e\}, \{e, g\}, \{e, h\}, \{b, e\}, \{a, b\}, \{a, c\}, \{c, f\}$  from first to last respectively. ■

## Problem 2

*Solution.* The algorithm is

- 1.
- 2.
- 3.

The time complexity is  $O(|V| \log |V| + |E|)$ . ■

## Problem 3

*Solution.* The algorithm is

- 1.
- 2.
- 3.

The time complexity is  $O(|V| + |E|)$ . ■

## Problem 4

*Solution.* The algorithm is

- 1.
- 2.
- 3.

The time complexity is  $O(|V| + |E|)$ .

