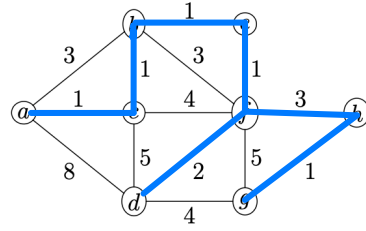
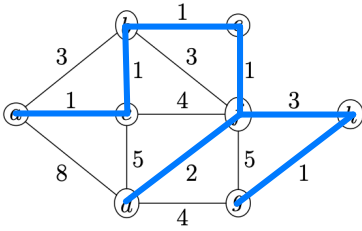


Exercise sheet 15

Question 15.1

Prim's algorithm:

Kruskal's algorithm:



from a: $a-c \rightarrow c-b$

$\rightarrow b-e \rightarrow e-f \rightarrow f-g$

$\rightarrow f-h \rightarrow h-g$

weight: $1+1+1+1+2+3+1=10$

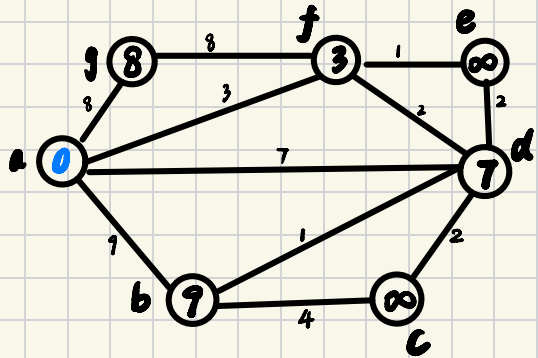
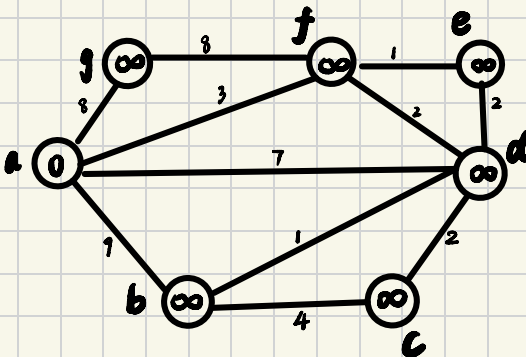
$a-c \checkmark \rightarrow b-c \checkmark \rightarrow b-e \checkmark$

$\rightarrow e-f \checkmark \rightarrow h-g \checkmark \rightarrow d-f \checkmark$

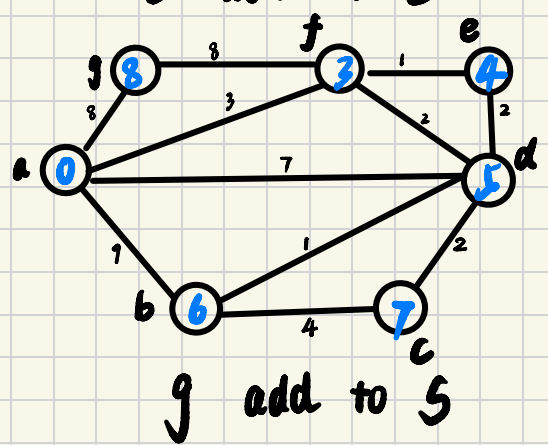
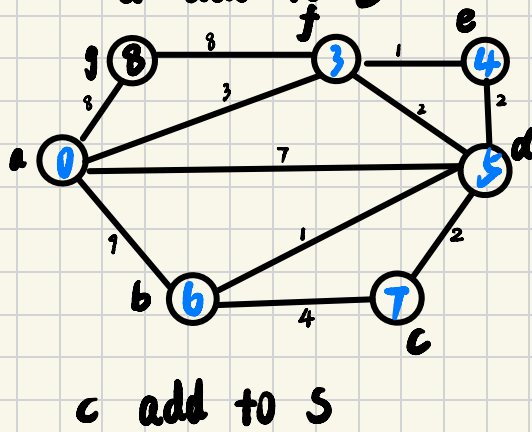
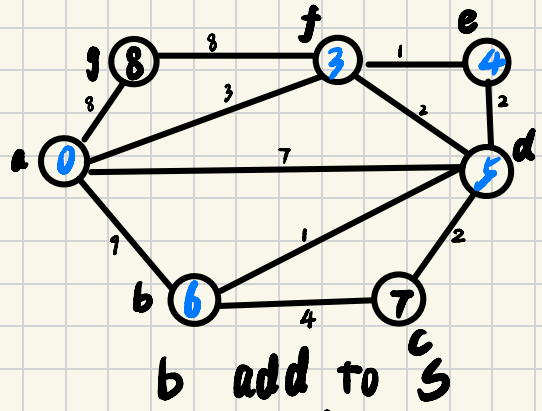
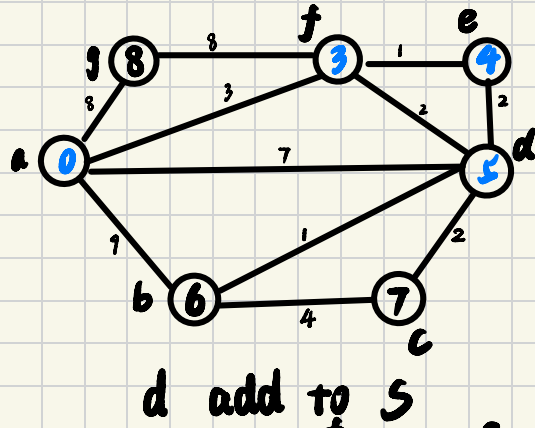
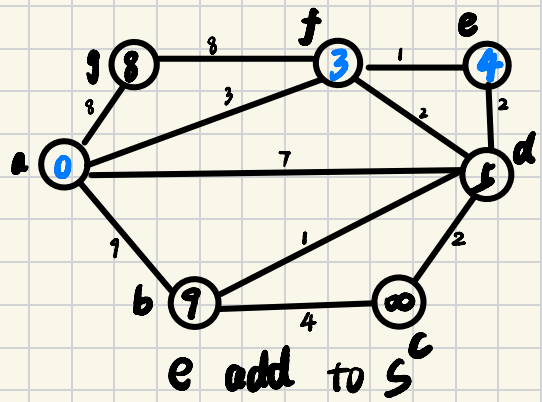
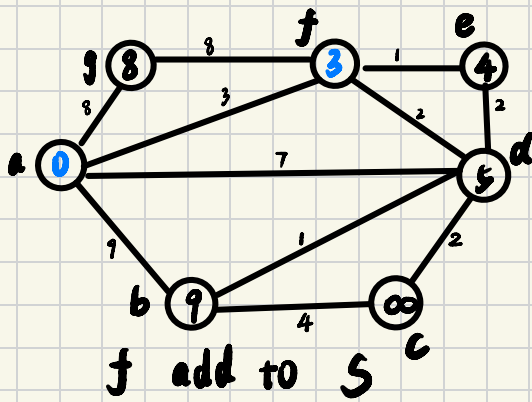
$\rightarrow b-f \times \rightarrow f-h \checkmark$

weight = $1+1+1+1+2+3+1=10$

Question 15.2



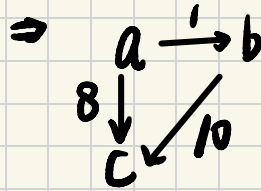
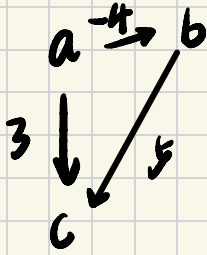
a add to S



the shortest path from $a \rightarrow c$: $a \rightarrow f \rightarrow d \rightarrow c$
 distance is 7

Question 15.3

counterexample: we calculate the shortest path from $a \rightarrow d$ for the algorithm mentioned: we need to plus 5 for all edges



then the shortest path after plusing 5 is

$a \rightarrow c$

and the distance is: 3

however, from the original graph, we can go in $a \rightarrow b \rightarrow c$, whose distance is 1.