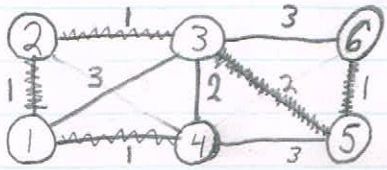
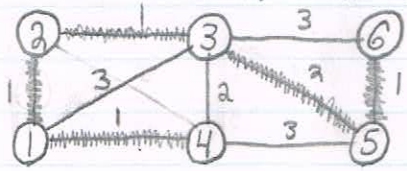
Name: Connor Raymond Stewart
ID: 10104125

# MATH 3802 Tutorial March 12:

(1) Show a minimum-weight Spanning tree obtained using Prim's algorithm starting with $r=v_1$. Point out the iterations in which there exists two or more choices for the edge to be added:




(2) Show a minimum-weight Spanning tree obtained using Kruskal's algorithm & an optimal Solution to (DMST) in the Proof of theorm 8.3 using the edge-ordering:



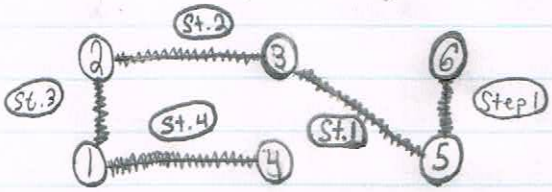

$(v_1e_2, v_3v_6, v_2v_4, v_1v_3, v_3v_4, v_4v_5, v_1v_4, v_4v_6, v_5v_4)$

| $e_1$ | $e_2$ | $e_3$ | $e_4$ | $e_5$ | $e_6$ | $e_7$ | $e_8$ | $e_9$ | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | * |

| A | $y_A$ | |
|---|---|---|
| | $e_1-e_2=0$ | 5 |
| | $e_2-e_3=0$ | 4 |
| | $0$ | 3 |
| | $e_4-e_5=-1$ | 2 |
| | $0$ | 2 |
| | $-1$ | 1 |
| | $0$ | 1 |
| | $3$ | 1 |

Problems:

(1) Find a minimum-weight Spanning tree obtained using Prim's algorithm starting with $r=v_5$:




(2) Find the same info as 22 using the edge ordering $(v_5v_6, v_2v_4, v_1v_2, v_1v_3, v_3v_4, v_4v_5, v_4v_6, v_3v_5, v_1v_4)$:

$(v_5v_6, v_2v_4, v_1v_2, v_1v_3, v_3v_4, v_4v_5, v_4v_6, v_3v_5, v_1v_4)$

| $e_1$ | $e_2$ | $e_3$ | $e_4$ | $e_5$ | $e_6$ | $e_7$ | $e_8$ | $e_9$ |
|---|---|---|---|---|---|---|---|---|
| (1) | (1) | (1) | (1) | 2 | (2) | 3 | 3 | 3 |