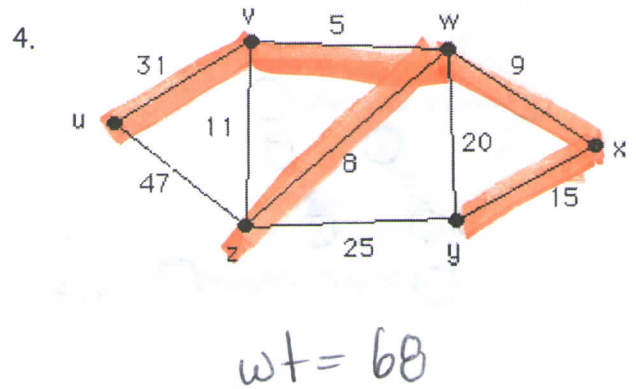
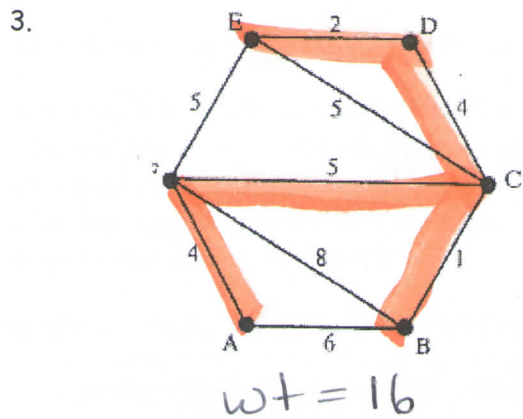
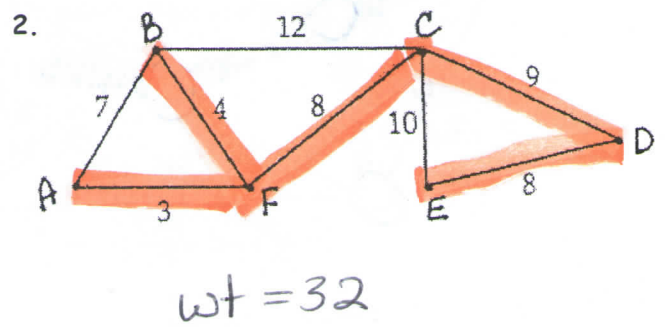
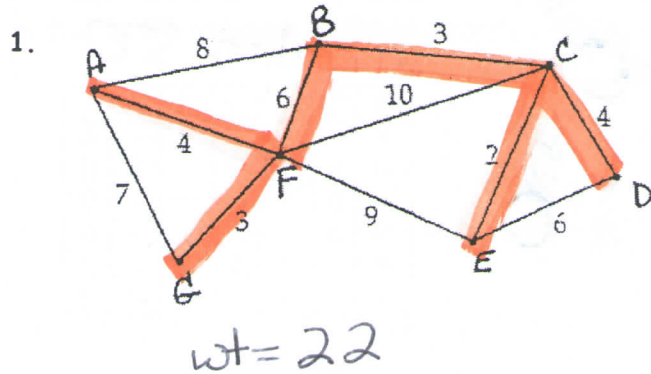
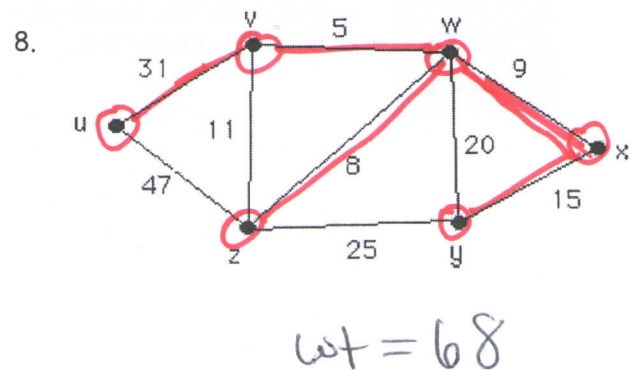
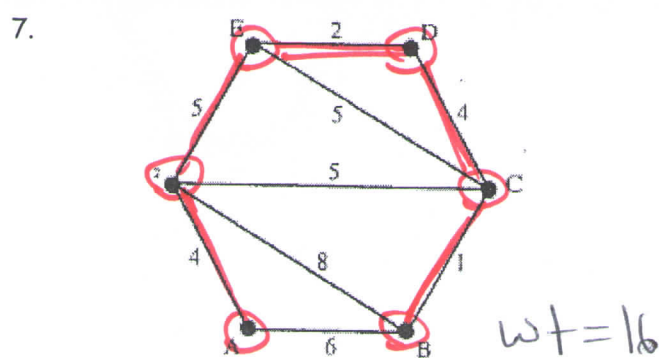
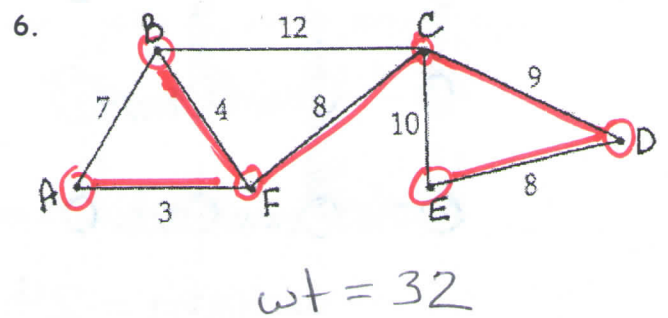
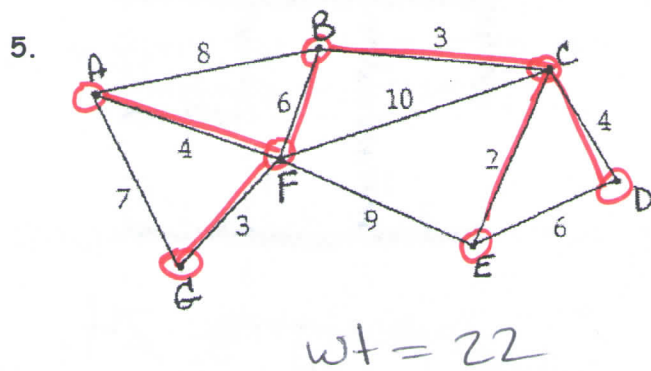


Worksheet #9 Graph Theory Applications--Minimum Spanning Trees

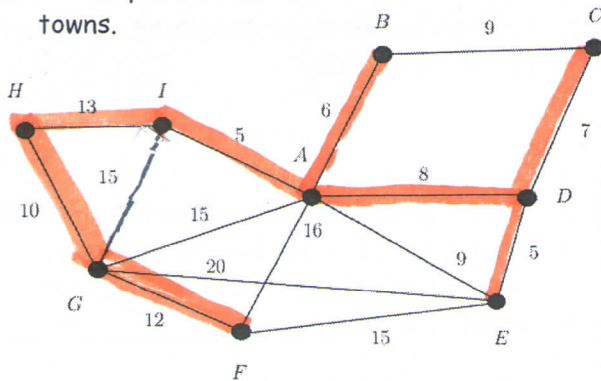
Use Kruskal's Algorithm to find a minimum spanning tree. Give the weight of the minimum spanning tree.



Use Prim's Algorithm to find a minimum spanning tree. Give the weight of the minimum spanning tree.



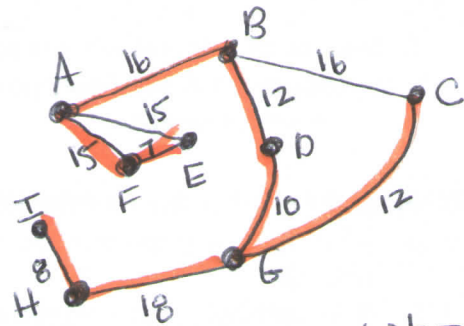
9. Suppose that, in making plans for winter storms, your local county government needs a design for repairing the county roads in case of an emergency. You are given a map of the towns in your county and the existing major roads between them. You are then asked to devise a plan that repairs the least number of miles of road but keeps a route open between each pair of towns.



wt = 66

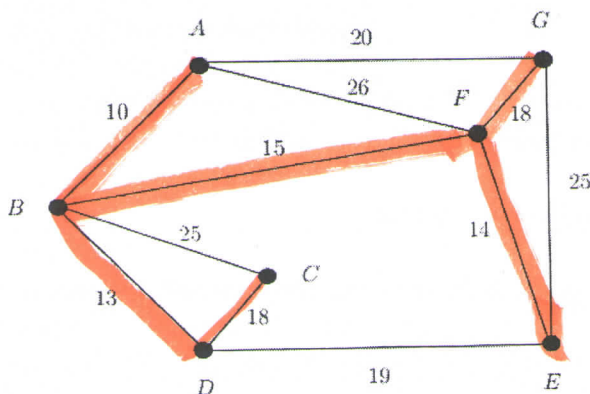
10. A local restaurant has opened an outdoor patio for the summer. The owner wants to hang nine festive light fixtures at designated locations on the overhead latticework. Because of the layout of the patio and the latticework, it is not possible to install wiring between every pair of lights. The grid below shows the distances in feet between lights that can be linked directly. The owner wants to use the minimum amount of wire to get all nine lights connected. What is the minimum amount of wire needed to connect all nine lights?

	A	B	C	D	E	F	G	H	I
A	-	16	-	-	15	15	-	-	-
B	16	-	16	12	-	-	-	-	-
C	-	16	-	-	-	-	12	-	-
D	-	12	-	-	-	-	10	-	-
E	15	-	-	-	-	7	-	-	-
F	15	-	-	-	7	-	-	-	-
G	-	-	12	10	-	-	-	18	-
H	-	-	-	-	-	-	18	-	8
I	-	-	-	-	-	-	-	8	-



wt = 98

11. There are seven small towns in Madison County that are connected to each other by gravel roads. The distances are given in miles. The county wants to pave some of the roads so that people can get from town to town on paved roads, either directly or indirectly. However, Madison 77 County is on a tight budget so the total number of miles paved needs to be minimum. Find and draw a network of paved roads that will fulfill the county's requirements.



wt = 88