

Answer Key

1. a. How many vertices does each graph have?

 G_1 6 G_2 6 G_3 6 G_4 6

- b. How many edges does each graph have?

 G_1 5 G_2 5 G_3 6 G_4 4

- c. Which graph is NOT a connected graph? G_4
- d. Which of the graphs has at least one cycle? G_3
- e. Which of the graphs is a tree? G_1 and G_2 .
2. a. What is the degree of each of the vertices in G_1 ?
- | | | | | | |
|-----------|---|-----------|---|-----------|---|
| $\deg(a)$ | 1 | $\deg(b)$ | 2 | $\deg(c)$ | 4 |
| $\deg(d)$ | 1 | $\deg(e)$ | 1 | $\deg(f)$ | 1 |
- b. List the leaves for G_1 . a, d, e, f
3. a. How many edges are in your new tree? 5
- b. How many leaves on your new tree? 3
- c. If you removed one edge, would the graph still be connected? no
4. a. Is this a **subgraph**? Yes
- Are all the vertices of G_1 also nodes of G ? Yes
- Are all the edges of G_1 also edges of G ? Yes
- b. Is this a **subgraph**? No
- Are all the vertices of G_2 also nodes of G ? Yes
- Are all the edges of G_2 also edges of G ? No
5. Multiple solutions

6. Multiple solutions depending on which node you start at, but for example...

1.

a

2.

a 2 b

3.

4.

5.

6.

7.