Exercises:

1) The points of a star are labeled A,B,C,D,E.
   a) \{(A,C), (C,E), (E,B), (B,D), (D,A)\}
   b) \{A,D,B\}
   c) Yes, the graph is connected.
   d) Cycle: \{A,C,E,B,D,A\} - Yes, this cycle contains all of the vertices.

2) a) \{(A,D), (D,C), (C,E), (E,B), (E,F), (F,A), (F,B), (B,C)\}
   b) Shortest path: \{F,A,D\}, longest path: \{F,B,E,C,D\}
   c) Yes, the graph is connected.
   d) One possible cycle: \{C, E, F, B, C\}, Cycle containing all of the vertices: \{C, D, A, F, B, E, C\}

3) The above graph has vertices labeled A,B,C,D,E,F,G.
   a) This graph has 11 edges. They are: \{(A,C), (A,D), (A,E), (A,F), (B,G), (B,F), (B,E), (B,D), (G,C), (G,D), (F,C)\}
   b) Shortest path: \{A,D,G\}, longest path: \{A,E,B,F,C,G\}
   c) Yes, the graph is connected.
4) Sandy should visit the houses in the following order: \{Sandy’s, D,F,T,R,C,J,B,A,Z, Sandy’s\}

5) We would like to find a cycle that starts (and ends) at Flo’s Flowers. One possibility is: \{Flo’s, H,R,F,P,Z,V,T,B,J,E,C,D,S,A,Flo’s\}
Maps and Colouring:

Exercises:

1) Determine how many regions each of the following maps have.

a)

b)

c)

d)

e)

f)
2) Colour each of the maps in exercise 1 using at most 4 colours.

a)

b)

c)

d)

e)

f)
3) Colour each of the following using at most 4 colours.

a)

b)

c)