Graph Theory Worksheet #1
November 26, 2018
2 Points

Circle one name.

Name: _____ **Name:** _____ **Name:** _____

1. A certain graph G has vertex set $\{A, B, C, D, E\}$ and edge set

$$\{\{A, B\}, \{A, E\}, \{B, C\}, \{C, D\}, \{C, E\}, \{D, E\}\}.$$

   (a) Sketch the graph in such a way that its edges do not cross, thus confirming that it is planar.

   (b) What is the order of the graph?

   (c) What is v?

   (d) What is e?

   (e) What is f?

   (f) List the vertex degree sequence in increasing order.

   (g) List the faces of the graph.

   (h) Give the degree of each face.

(i) Another certain graph H has vertex set $\{V, W, X, Y, Z\}$ and edge set

$$\{\{V, X\}, \{V, Y\}, \{W, X\}, \{W, Y\}, \{W, Z\}, \{X, Z\}\}.$$

Sketch this graph.

Explain why the graphs G and H are isomorphic and give the correspondence between the vertices.

- $A \longrightarrow$
- $B \longrightarrow$
- $C \longrightarrow$
- $D \longrightarrow$
- $E \longrightarrow$

2. A certain planar graph has vertex degree sequence $3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4$.

   (a) How many vertices does it have?

   (b) How many edges does it have?

   (c) How many faces does it have?

   (d) What is the sum of the face degrees?