**Graph Theory**

Try drawing the following images without lifting your pencil and without going over a line twice. Identify what path you took.

A

B

C

D

E

F

A

B

C

D

E

A

D

B

C

E

F

A

B

C

D

E

A

B

C

D

E

F

G

H

A

B

C

D

E

F

G

I

H

J

**Terms to know:**

* **Vertices** are **points** (identified by letters or numbers) on a graph
* **Edges** are **lines** that connect to vertices
* **Loops** are edges that connect a vertex to itself
* **Order** is the number of vertices in a graph
* **Degree** is the number of lines that connect to a specific vertex  
  \*a LOOP counts for 2 degrees\*
* **Adjacent Vertices:** Vertices that next to each other. E.g A and B are adjacent, but B and C are NOT adjacent.

**Example #1**

A

B

C

Vertex (Vertice)

Edge

Loop

Vertices:

S = { A, B, C }

Edges:

G = {AB, AC, BB}

Order:

Order = 3

Degree:

d(A) = 2  
d(B) = 3  
d(C) = 1

**Example #2**

A

B

C

D

Vertices:

S = { A, B, C, D }

Edges:

G = {AB, AD, BC, BD, CD}

Order:

Order = 4

Degree:

d(A) = 2 d(B) = 3  
d(C) = 2 d(D) = 3

**Example #3**

A

B

C

D

E

Degree:

d(A) = 2 d(D) = 1  
d(B) = 2 d(E) = 1  
d(C) = 4

Order:

Order = 5

Edges:

G = {AB, AC, BC, CD, CE}

Vertices:

S = {A, B, C, D, E}

**Example #4**

A

B

C

D

Vertices:

S = {A, B, C, D}

Edges:

G = {AB,AC,AD,BC,BD,CD}

Order:

Order = 4

Degree:

d(A) = 3 d(D) = 3  
d(B) = 3 d(C) = 3

**Practice:**

A

D

B

C

E

F

Name the following:

1) The vertices

2) The edges

3) The Order

4) The degrees

A

B

C

D

E