

Elementary Division

考号/Exam Code: _____ 姓名/Name: _____ 学校/School: _____

1. Graph Theory

Draw a graph using the first letters of each person's name to represent the ways that 5 friends share secrets: Ann and Beth share, Beth and Di share, Di and Cara share, Ella and Di share, Ann and Cara share, and Ann and Ella share. For them to remain friends, this must be an undirected graph.

1.

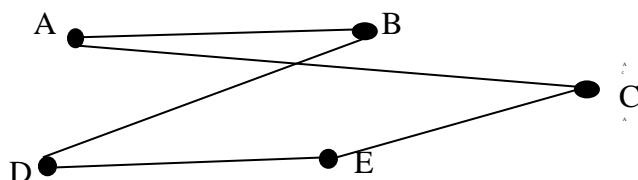
2. Graph Theory

In terms of the edges, what special kind of graph is defined by the vertices $\{P, Q, R, S, T\}$ and the undirected edges $\{PQ, PR, TP, RS, TS, QS, TQ, RT, SP, RQ\}$?

2.

3. Graph Theory

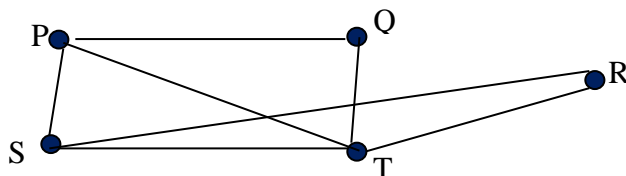
How many cycles are there in this undirected graph?



3.

4. Graph Theory

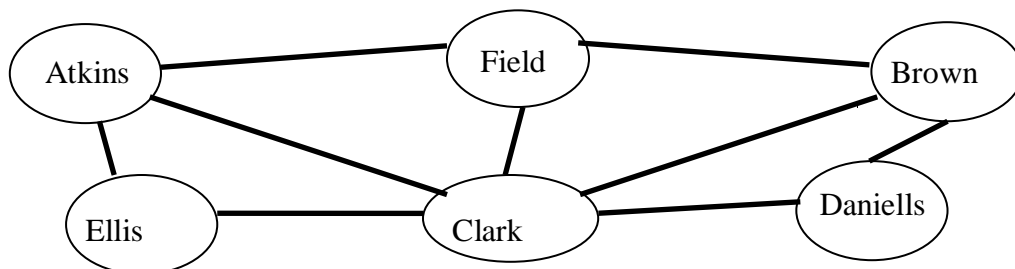
Given the following graph, identify all simple paths of any length that start at Q and end at S.



4.

5. Graph Theory

A pizza delivery boy has to visit 6 different homes and wants to use every road in the neighborhood once and only once. Determine if his route is traversable. If so, list the nodes by first letter in any correct order. Otherwise, say "NOT POSSIBLE".



5.

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1. Graph Theory

1.

用每个人名字的第一个字母画一个图，来表示 5 个朋友分享秘密的方式：Ann 和 Beth 分享，Beth 和 Di 分享，Di 和 Cara 分享，Ella 和 Di 分享，Ann 和 Cara 分享，Ann 和 Ella 分享。为了让他们成为朋友，这必须是一个无向图。

2. Graph Theory

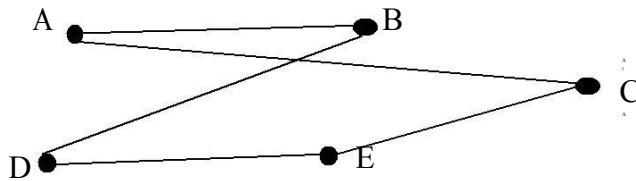
2.

就边而言，顶点 {P、Q、R、S、T} 和和无向边缘 {PQ、PR、TP、RS、TS、QS、TQ、RT，SP，RQ} 定义了什么样的特殊图形？

3. Graph Theory

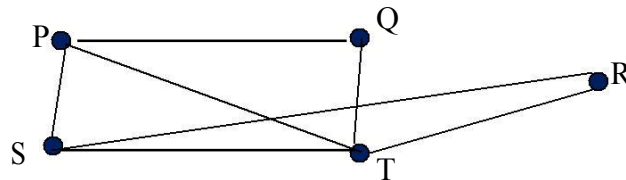
3.

在这个无向图中有多少循环？

**4. Graph Theory**

4.

给出下面的图表，识别所有从 Q 出发到达 S 的简单路径。

**5. Graph Theory**

5.

一个送披萨的男孩必须去 6 个不同的家，他想在附近的每一条路上路过一次，而且只路过一次。确定他的路线是否可通行。如果是，请按任何正确的顺序用第一个字母列出节点。否则，说“NOT POSSIBLE”。

