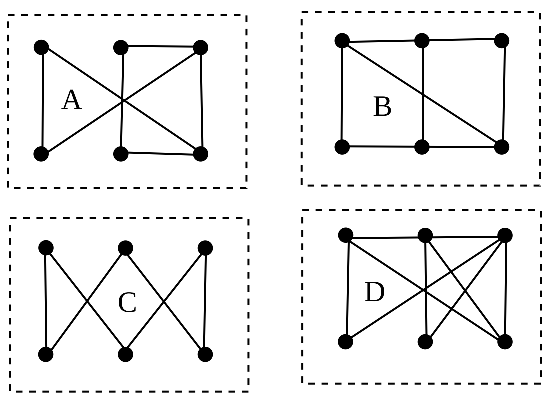
MAT 118, Chapter 5 Sample Questions
Exam on Monday, Oct 28

(1) $\boxed{}$ This famous mathematician lived from 1707 to 1783 and invented graph theory (among many other accomplishments).
(a) Johann Bernoulli
(b) Leonard Euler
(c) Fredrich Gauss
(d) Issac Newton
(e) Rene Descarte
(f) none of these

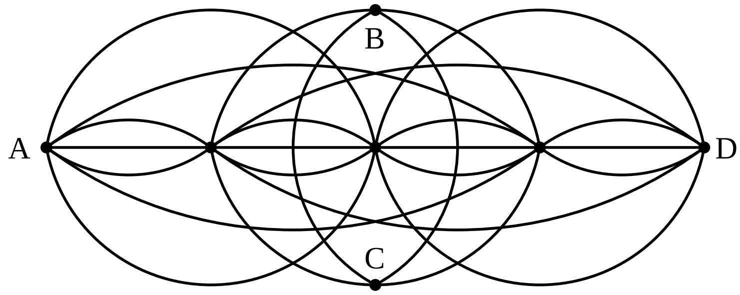
(2) $\boxed{}$ The algorithm given in the text for finding Euler circuits and paths is called
(a) Euler's algorithm
(b) Fleury's algorithm
(c) Gauss's algorithm
(d) Hierholzer's algorithm
(e) Bernoulli's algorithm
(f) none of these



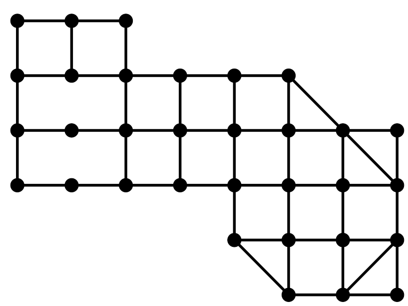
(3) $\boxed{}$ Which graphs above have an Euler circuit?
(a) Only A
(b) A and D
(c) B and C
(d) Only C
(e) Only D
(f) none of these

(4) $\square$ On the island of Pentecost in the Pacific a traditional art form is to draw elaborate figures in the sand in a continuous line, never lifting ones finger from the sand from start to end. To draw the following figure without retracing any edges, where can the artist start and finish?

(a) start at A, finish at B
(b) start at A finish at C
(c) start at A finish at D
(d) start at B finish at C
(e) start at B finish at D
(f) you can start anywhere



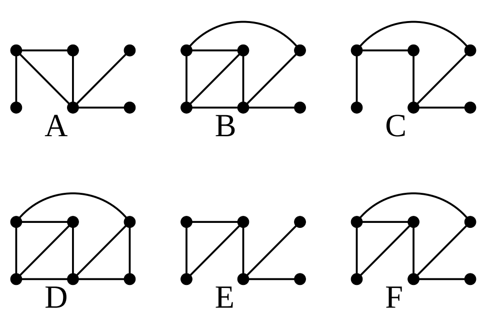
The following figure is used for problem 5. This graph represents the streets in a town. A police car must travel over each street at least once and must start and end at the same vertex.



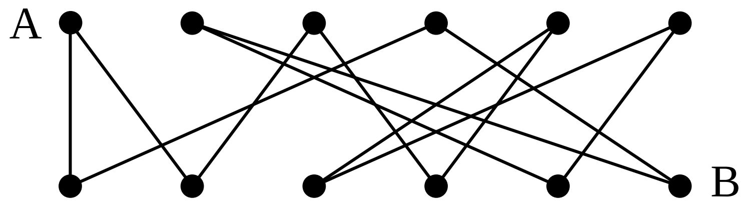
(5) $\square$ What is the minimum number of streets that must be visited twice in an Euler circuit of the town?
(a) 0
(b) 2
(c) 4
(d) 5
(e) 6
(f) none of these

(6) $\square$ Suppose Sam knows Joe, Ted and Max. In addition, Max knows Ted, Zak and Pat. Which graph on the right represents these relationships (vertices=people, edges=knows).

(a) A
(b) B
(c) C
(d) D
(e) E
(f) F



The following figure is used for problems 7 to 9. This graph is "bipartite". This means the vertices are drawn in two rows and vertices are only connected to vertices in the other row.



(7) ☐ How many edges does this graph have?
(a) 8
(b) 9
(c) 10
(d) 11
(e) 12
(f) none of these

(8) ☐ How many different paths are there from A to B?
(a) 1
(b) 2
(c) 4
(d) 5
(e) 6
(f) none of these

(9) ☐ What is the fewest number of edges needed to travel from A to B?
(a) 1
(b) 2
(c) 3
(d) 4
(e) 5
(f) none of these