MAT 114 Fall 2002 Test 3 Name:

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Hours: MWF 11:20 – 12:20 MW 1:40 – 2:40

Please show all your work, write neatly and box your answer. No calculators are allowed.

1. (9pts) *a.* Draw a graphical representation of the set $[-2, 1) \cup (3, \infty)$.

b. Simplify $(0, 3] \cap (1, \infty)$.

c. Simplify $[5, 10) \setminus (-\infty, 8)$.

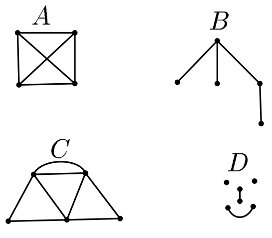
2. (10pts) Let $f(x) = x^2 + 1$.

a. Find $f(4)$.

b. Find $f(-2)$.

c. Find all possible values for a if $f(a) = 10$.

3. (10pts) Consider the four graphs below.



a. Which graph is complete?

b. Which graph has an Euler circuit?

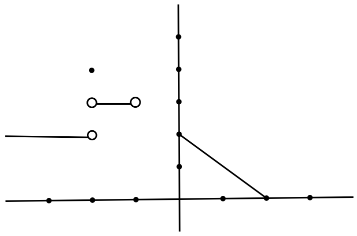
c. Which graph is a tree?

d. Which graph is not connected?

e. Which graph has 6 edges?

4. (6pts) Draw a graph with 4 vertices such that degree of the vertices are 1, 2, 3 and 4.

5. (15pts) The graph of the function f is given below. Find



a. $\mathrm{dom}(f) =$

b. $\mathrm{ran}(f) =$

c. $f(-2) =$

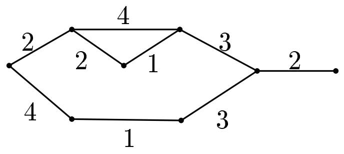
d. Fill in the table

x	-5	-1.5	-1	0		
$f(x)$					0	1

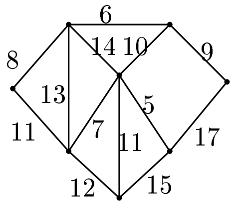
6. (10pts) Let f be a linear function such that $f(1) = 5$ and $f(-2) = -1$.
a. Find the formula that defines f.
$f(x) =$

b. Find $f(2) =$

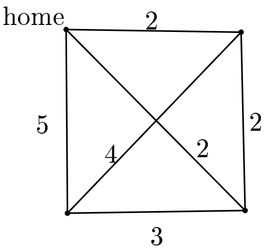
7. (9pts) Mark the critical path of the scheduling network. What is the minimum time required to finish the job?



8. (10pts) Use Kruskal's algorithm to find a minimum cost spanning tree. What is the minimum cost?



9. (9pts) Use the nearest neighboor algorithm to find a Hamiltonean circuit. What is the cost of this circuit?



10. (6pts) How many Hamiltonean circuits are there in a complete graph with 5 vertices?

11. (6pts) Solve the equation $2x - 4 = 3y$ for x.