**Math 231 – HW 8 Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Epp 2nd Ed. 5.1 1, 2, 3, 5, 6, 7, 10, 15

5.2 25a, b

5.3 1, 4 (explain why rather than give a formal proof), 6.

**5.1 (1)** Which of these sets are equal?

(a) {a,b,c,d}

(b) {d,e,a,c}

(c) {d,b,a,c}

(d) {a,a,d,e,c,e}

**5.1 (2)** Is 4 = {4}? Explain!

**5.1 (3)** Graph each set on a number line.

A={0,1,2}



B={x∈|-1≤x<3}



C={x∈|-1<x<3}



D={x∈|-1<x<3}



E={x∈|-1<x<3}



Which of these sets were equal?

**5.1 (5)** Let A={c,d,f,g}, B={f,j}, and C={d,g}. Answer each of the following questions.

(a) Is B ⊆ A? Explain.

(b) Is C ⊆ A? Explain.

(c) Is C ⊆ C? Explain.

(d) Is C a proper subset of A? Explain.

**5.1 (6)** Yes or no? Be ready to discuss your answers.

(a) Is 3∈{1,2,3}?

(b) Is 1⊆{1}?

(c) Is {2}∈{1,2}?

(d) Is {3}∈{1,{2},{3}}?

(e) Is 1∈{1}?

(f) Is {2}⊆{1,{2},{3}}?

(g) Is {1}⊆{1,2}?

(h) Is 1∈{{1},2}?

(i) Is {1}⊆{1,{2}}?

(j) Is {1}⊆{1}?

**5.1 (7)** Let A={b,c,d,f,g} and B={a,b,c}. Find each of the following:

(a) A∪B

(b) A∩B

(c) A-B

(d) B-A

**5.1 (10)** True or False? Be ready to discuss your answers.

(a) ?

(b) ?

(c) ?

(d) ?

(e) ?

(f) ?

(g) ?

(h) ?

**5.1 (15)** Neatly shade the region corresponding to each set.

(a) A∩B (b) B∪C

**A**

**B**

**C**

**U**

**A**

**B**

**C**

**U**

(c) AC (d) A-(B∪C)

**A**

**B**

**C**

**U**

**A**

**B**

**C**

**U**

(e) (A∪B)C (f) AC∩BC

**A**

**B**

**C**

**U**

**A**

**B**

**C**

**U**

**5.2 (25a)** Illustrate one of the distributive laws by shading in the region corresponding to A∪(B∩C) on one copy of the diagram and (A∪B)∩(A∪C) on the other. Label them!

**A**

**B**

**C**

**U**

**A**

**B**

**C**

**U**

**5.2 (25b)**

Illustrate the other distributive law by shading in the region corresponding to A∩(B∪C) on one copy of the diagram and (A∩B) ∪ (A∩C) on the other. Label them!

**A**

**B**

**C**

**U**

**A**

**B**

**C**

**U**

**5.3 (1)**

(a) Is the number 0 in ∅? Explain.

(b) Is ∅={∅}? Explain.

(c) Is ∅∈{∅}? Explain.

**5.3 (4)** Show that (explain informally) that for all subsets A of a universal set U, A∩AC=∅, and A∪AC=U.

**5.3 (6)** Draw Venn diagrams to describe the sets A, B, and C that satisfy the given conditions:

(a) A∩B=∅, A⊆C, C∩B≠∅.

(b) A⊆B, C⊆B, A∩C≠∅.

(c) A∩B≠∅, B∩C≠∅, A∩C=∅.