**Lab for Section 2.4** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Use good notation and show appropriate work. Write explanations in* ***complete sentences***.

1. (a) 125% of what number is 85? (b) Joe paid $68 for a pair of jeans that were 20% off.
 What was the original price for the jeans?

2. In each Venn Diagram, shade the region associated with the given set.

 (a) *A* ∩ *B* (b) *A* ∪ *B*  (c) (*A* ∩ *B*)ʹ (d) *A*ʹ ∪ *B*ʹ

*U*

*A*

*B*

*U*

*A*

*B*

*U*

*A*

*B*

*U*

*A*

*B*

3. In each Venn Diagram below, shade the region associated with the given set.
*The numbers are the names of the different regions and not elements of the sets.*

 (a) (*A* ∪ *B*ʹ) – *A* (b) *A* ∪ (*B* ∪ *A*)ʹ (c) *A* ∩ (*B* ∪ *C*ʹ)ʹ (d) (*A* ∩ *B*) – *C*

*U*

*A*

*B*

1

2

3

4

*U*

*A*

*B*

1

2

3

7

4

5

6

8

*U*

*A*

*B*

*C*

*U*

*A*

*B*

*C*

4. Describe the shaded region using set operation notation:

 (a) (b) (c)

*U*

*A*

*B*

*U*

*A*

*B*

*C*

*U*

*A*

*B*

*C*

5. In a survey of 50 people, 25 said they read the Forum and 16 said they listened to the news on NPR. Five of the responders said they read the Forum and listened to the news on NPR. Construct a Venn diagram using this information. How many surveyed neither read the Forum nor listened to NPR?

*U*

*F*

*N*

6. Use *T* = {t, o, p}, *P* = {p, u, g}, *V* = {v, e, t}, and . Find each.

 (a) *V – T* (b) (*T* – *P*) ∪ *V*

 (c) (*T* ∩ *P*ʹ) ∩ *V* (d) *T* × *P*

***Extra if time, though you need to be able to do these for the exam.***

7. Shade the given sequences of Venn Diagrams to justify the De Morgan’s Law (*A* ∩ *B*)ʹ = *A*ʹ ∪ *B*ʹ.

 *A* ∩ *B* ⟹ (*A* ∩ *B*)ʹ

*U*

*A*

*B*

*U*

*A*

*B*

 *A*ʹ *B*ʹ ⟹ *A*ʹ ∪ *B*ʹ

*U*

*A*

*B*

*U*

*A*

*B*

*U*

*A*

*B*

8. Create sequences of Venn Diagrams to justify that the distributive property of union over intersection.

 Label the diagrams as was done in problem 7.

*U*

*A*

*B*

*C*

*U*

*A*

*B*

*C*

*U*

*A*

*B*

*C*

*U*

*A*

*B*

*C*

*U*

*A*

*B*

*C*

*U*

*A*

*B*

*C*