Math 112-01
Final Exam Information

The comprehensive final exam is worth 150 points and is scheduled for Monday, December 11, 8:00am–9:50am, in Room 2625. Special office hours during finals week:

- Monday, December 11: 12:00pm – 2:00pm

- Tuesday, December 12: 10:00am – 11:00am

- Thursday, December 14: 11:00am – 1:00pm

The following skills and concepts may be assessed on the final exam. The attached formula sheet will also be attached to the final exam. You are responsible for knowing any other formulas that may be required.

Skills Checklist for Final Exam

1. Determine whether a set is well defined.

2. Determine whether a given object is an element of a certain set.

3. Write sets in roster (listing) notation or in set-builder notation.

4. Demonstrate the proper use of the symbols of set theory.

5. Determine whether sets are equal. Determine whether sets are in a one-to-one correspondence.

6. Determine subsets of a given set. Determine whether one set is a subset of another.

7. Determine the cardinality of a set.

8. Find the complement of a set.

9. Find unions and intersection of sets.

10. Determine relative complements (differences of sets).

11. Use Venn diagrams to prove set identities.

12. Shade the region of a Venn diagram corresponding to a given combination of sets.

13. Use set notation to name the shaded region of a Venn diagram.

14. Solve application problems using two- or three-set Venn diagrams.

15. Identify statements.

16. Write the negation of a statement.

17. Write statements symbolically.

18. Construct basic truth tables, including those for negations, conjunctions, disjunctions, conditionals, and biconditionals.

19. Construct truth tables for compounds statements.

20. Use DeMorgan's laws to write the negation of a compound statement.

21. Write the converse, inverse, and contrapositive of a conditional statement.

22. Find the interest earned by an account bearing (simple or compound) interest.

23. Find the future value of an account bearing (simple or compound) interest.

24. Find future values and payments for annuities.

25. Find the present value of future payments.

26. Find mortgage payments and construct an amortization schedule.

27. Use the fundamental principle of counting in counting problems.

28. Use permutations and combinations in basic counting problems.

29. List the sample space for an experiment and identify events.

30. Know the difference between theoretical and experimental probabilities.

31. Determine the theoretical probability of an event.

32. Given data, determine the experimental probability of an event.

33. Understand and use the properties of probability (complements, unions, intersections, etc.).

34. Draw tree diagrams and determine probabilities in multistage experiments.

1. **Simple Interest Formulas**

   - $I = Prt$
   - $A = P + Prt$

2. **Compound Interest Formula**

   - $A = P\left(1 + \frac{r}{n}\right)^{nt}$

3. **Effective Rate**

   - $E = \left(1 + \frac{r}{n}\right)^{n} - 1$

4. **Annuity Formulas (Future value of payments)**

   - $A = \dfrac{R \cdot \left[\left(1 + \frac{r}{n}\right)^{nt} - 1\right]}{\left(\frac{r}{n}\right)}$
   - $R = \dfrac{A \cdot \left(\frac{r}{n}\right)}{\left[\left(1 + \frac{r}{n}\right)^{nt} - 1\right]}$

5. **Present value of future payments**

   - $P = \dfrac{R \cdot \left[1 - \left(1 + \frac{r}{n}\right)^{-nt}\right]}{\left(\frac{r}{n}\right)}$

6. **Mortgage Formula (Payments for present value)**

   - $R = \dfrac{P \cdot \left(\frac{r}{n}\right)}{\left[1 - \left(1 + \frac{r}{n}\right)^{-nt}\right]}$

7. **Counting Formulas**

   - Permuations of n objects: $\quad n!$
   - Permutations of r objects taken from n: $\quad {}_nP_r = \dfrac{n!}{(n - r)!}$
   - Permutations of n objects where some are alike: $\quad \dfrac{n!}{n_1!\,n_2! \cdots n_p!}$
   - Combinations of r objects taken from n: $\quad {}_nC_r = \dfrac{n!}{(n - r)!\,r!}$