# MAT 230 Module One Homework

**General:**

* Before beginning this homework, be sure to read the textbook sections and the material in Module One.
* Type your solutions into this document and be sure to show all steps for arriving at your solution. Just giving a final number may not receive full credit.
* You may copy and paste mathematical symbols from the statements of the questions into your solution. This document was created using the Arial Unicode font.
* These homework problems are proprietary to SNHU COCE. They may not be posted on any non-SNHU website.
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1. Suppose C = {red, blue, white, black}. For a) and b) below, fill in two values that make the statement true (more than one solution is possible).
2. \_\_red\_\_\_ ∈ C
3. \_\_yellow\_\_\_ ∉ C

This problem is similar to Example 1 and to Exercises 1 and 2 in Section 1.1 of your SNHU MAT230 textbook.

1. List the elements of the set {x | x ∈ ℤ and x2 < 30}.

This problem is similar to Example 5 and to Exercise 4 in Section 1.1 of your SNHU MAT230 textbook.

{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5}

1. Consider U = {2, 5, blue, apple, $}, A={2, blue, $}, and B={5, $}. Complete parts a) and b) below.
2. Is A ⊆ U? Explain why or why not.
3. Is B ⊆ A? Explain why or why not.

This problem is similar to Examples 6 and 8 and to Exercises 15–17 in Section 1.1 of your SNHU MAT230 textbook.

1. Yes, because each of A’s elements can be found in U, making A a subset of U.
2. No, because each of B’s elements cannot be found in A, meaning B is not a subset of A.
3. Consider the following sets U, A, B, and C.

U = {mathematics, history, marketing, geography, psychology, English, finance, statistics, sociology}

A = {marketing, geography, English, statistics}

B = {mathematics, geography, psychology, English}

C = {mathematics, marketing, geography, psychology, sociology}

Compute each of the following:

1. A ∪ C =
2. C ∩ B =
3. =



1. A ∪ B – C =
2. A ⊕ B =

This problem is similar to Examples 1–6 and to Exercises 1–4 in Section 1.2 of your SNHU MAT230 textbook.

1. {marketing, geography, English, statistics, mathematics, psychology, sociology}
2. {mathematics, geography, psychology}
3. {mathematics, history, marketing, psychology, finance, statistics, sociology}
4. {English, statistics}
5. {marketing, statistics, mathematics, psychology}
6. The records of 100 SNHU students show the following courses taken:

53 students took History

41 students took Marketing

48 students took Writing

18 students took History and Marketing

21 students took Marketing and Writing

7 students took all 3 courses

9 students took none of these courses

Answer the following questions. Show how you obtained your solution.

1. How many students took Marketing and Writing, but not History?
2. How many students took onlyHistory?

This problem is similar to Example 10 and to Exercises 25–28 in Section 1.2 of your SNHU MAT230 textbook.

1. 14, because we know that 21 students total took both, and 7 took all three, so we subtract.
2. 23. In order to compute this, the final intersection between History and Writing needs to be found. You can do this by using Theorem 3 in the textbook in section 1.2 and then implementing algebra. We know that the cardinality of the union of all sets is 100 and this can be found by adding the cardinality of each separate set, subtracting the intersections between each pair of two sets, and then adding back the cardinality of the intersection between all participating sets. Since we do not know the intersection between History and Writing, this serves as our x. As a formula you would get

|H ∪ M ∪ W ∪ N| = |H| + |M| + |W| + |N| - |H ∩ M| - |M ∩ W| - |H ∩ W| + |H ∩ M ∩ W| + |N|

100 = 119 - |H ∩ W|

|H ∩ W| = 19

Now that we have the intersection between History and Writing we can find how many students took only History by subtracting from the cardinality the intersections between History and Marketing and also History and Writing, and then adding back in the cardinality of the intersection between all three sets, giving us 23.

1. Consider the sequence defined by an = (n2 – n) / 2.
2. Is this a recursive or explicit equation? Explain why.
3. Using the formula, list the first 4 terms of the sequence (starting with n=1).

This problem is similar to Examples 4–7 and to Exercises 7–14 in Section 1.3 of your SNHU MAT230 textbook.

1. This would be considered an explicit equation because it does not rely on previous terms to define the next term.
2. 0, 1, 3, 6
3. Consider the sequence defined by a1 = 3 and an = 5 – 2an-1.
4. Is this a recursive or explicit equation? Explain why.
5. Using the formula, list the first 4 terms of the sequence (starting with n=1).

This problem is similar to Examples 4–7 and to Exercises 7–14 in Section 1.3 of your SNHU MAT230 textbook.

1. This is a recursive equation because it relies on the previous term to define the next term.
2. 3, -1, 7, -9
3. Consider the following sets.

U = {pink, purple, red, blue, gray, orange, green, yellow, indigo, violet}

A = {purple, red, orange, yellow, violet}

B = {blue, gray, orange, green}

C = {pink, red, blue, violet}

Represent each of the following sets by an array of zeros and ones. Explain your reasoning.

1. A ∪ C.
2. A ∩ B.



This problem is similar to Examples 12 and 13 and to Exercises 26 and 27 in Section 1.3 of your SNHU MAT230 textbook.

1. 0, 1, 1, 1, 0, 1, 0, 1, 0, 1
2. 0, 0, 0, 0, 0, 1, 0, 0, 0, 0
3. 0, 1, 0, 0, 0, 0, 0, 1, 1, 0

These representations are found by determining the union, intersection, or compliment, and comparing it against U. If the element corresponds to an element in your determinations, a 1 is marked, otherwise a 0 is marked.

1. Find a, b, and c to solve the equation below:



This problem is similar to Example 4 and to Exercises 3 and 4 in Section 1.5 of your SNHU MAT230 textbook.

a = ???

b = ???

c = ???

1. Use the following matrices for the computations below.



1. Compute A + C.
2. Compute AB. If this product is undefined, explain why.
3. Compute BA. If this product is undefined, explain why.

This problem is similar to Examples 5 and 7 and to Exercise 5 in Section 1.5 of your SNHU MAT230 textbook.



1. Undefined because m does not equal n