MATH 180 - Homework 1

Lixiao Yang - `ly364@drexel.edu`

January 15, 2022

Question 1

1. {5, 7}
2. {1, 3, 4, 5, 6, 7, 8, 11}
3. {1, 3, 11}
4. {4, 6, 8}

Question 2

1. 27
2. 2
3. 13

Question 3

{2, 4, 6}

Question 4

{1, 2, 3, 4, 5, 6, 7, 8, 10, 12}

Question 5

A = {1, 2, 3} , B = {2, 3, 4, 5}

Question 6

Since $|A \cup B| = |A| + |B| - |A \cap B|$, with the conditions listed above, we can get that $|A| + |B| = 15$.
With $|A| = |B|$ we can conclude that $|A| = |B| = 7.5$ which is impossible for a set.
So there are no conforming sets A and B.

Question 7

1. The smallest possible value is 4, the largest possible value is 9.

2. The smallest possible value is 0, the largest possible value is 4.

3. The smallest possible value is 4, the largest possible value is 20.

Question 8

1. $A = \{11, 13, 15, 16, 17, 18, 19, 20, 21, 22\}$
   This set has a size 10 and it fits the result that $X \setminus A = \{10, 12, 14\}$.

2. $B = \{n \in \mathbb{N} : 10 \leq n \leq 14\}$
   This set has a size 5 and satisfies $B \subseteq X$.

3. $E = \{10, 10, 10, 10, 10, 10, 10, 10, 10, 10\}$
   This set is a subset of X and $|E| = E = 10$.