CIS-7 Unit 3 In Class Work

September 13, 2025

1. $A \in B$

2. $V \in T$

3. $\{1 \quad 2 \quad 3 \quad 4 \quad 5\}$

4. $\{1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9\}$

5. $F = \emptyset$

6. (a) Get the cardinality of the set. If they aren't the same, they are not equal.

   (b) Sort each set.

   (c) Check element by element for equality, if one doesn't match then they are not the same.

7. $\{R \in T \mid |R| > 7\} = \{3, 7, 10, 14, 17\}$

8. (a) $\{x \mid x \in \mathbb{Z}, Y^3 > 3\}$

   (b) $Y = \{x \mid x \in \mathbb{Z}, Y^2 < 100\}$

   (c) $\{Y \in \mathbb{Z} \mid Y^2 < 100\}$

   (d) $\{S \mid S = 9Y, Y \in \mathbb{N}\}$

9.
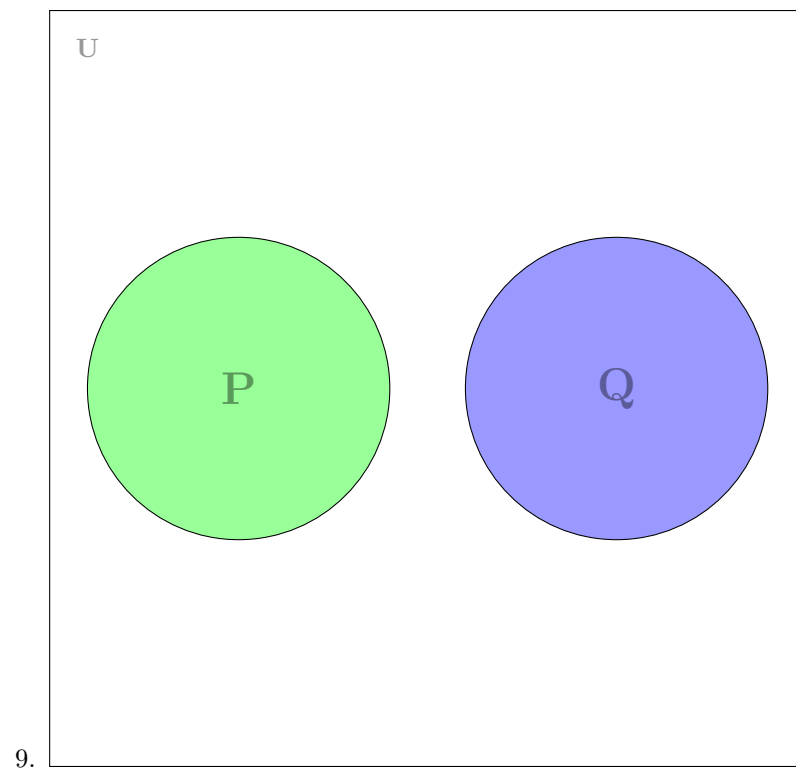
10. (a) True.
     (b) False.
     (c) $X \subset Y$ $X \neq Y$ Not strictly true, if $X = Y$ $X \subset Y$

11. (a) $\{10, 20, 30, 40, 50, 60, 70\}$
     (b) $\{10, 20, 30, 40, 50, 100, 200\}$
     (c) $\{30, 40, 50, 60, 70, 100, 200\}$

12. (a) $\{10, 15\}$
     (b) $\{15, 25, 35\}$
     (c) $\{15, 60\}$

13. (a) $'X = \{10, 25, 35, 50, 55, 60, 70, 75, 80\}$
     (b) $'Y = \{10, 20, 35, 45, 65, 70, 75, 80\}$
     (c) $'Z = \{10, 20, 25, 40, 45, 60, 70, 75, 80\}$

14. (a) $\{2, 10\}$
     (b) $\{4\}$
     (c) $\{2, 4, 10\}$

15. (a) $\{1, 2, 3, 4, 5, 9, 10, 11\}$
     (b) $\{2, 3, 6, 10, 12\}$
     (c) $\{1, 4, 5, 6, 9, 11, 12\}$

16. $\{\{2, 3, 4\}, \{2, 3\}, \{2\}, \{3, 4\}, \{3\}, \{4\}\}$

17.

$$T = \{2, 4\}, \quad U = \{6, 8\}, \quad W = \{1, 3\}$$

$$T \times U = \{(2, 6), (2, 8), (4, 6), (4, 8)\}$$

$$T \times W = \{(2, 1), (2, 3), (4, 1), (4, 3)\}$$

$$U \times W = \{(6, 1), (6, 3), (8, 1), (8, 3)\}$$

$$T \times U \times W = \{(2, 6, 1), (2, 6, 3), (2, 8, 1), (2, 8, 3), (4, 6, 1), (4, 6, 3), (4, 8, 1), (4, 8, 3)\}$$

18. (a) $A = \{2, 3, 5, 9\}$ $\Rightarrow$ $(0\,1\,1\,1\,0\,1\,0\,0\,0\,1)$
     (b) $B = \{1, 4, 6, 8\}$ $\Rightarrow$ $(0\,1\,0\,0\,1\,0\,1\,0\,1\,0)$
     (c) $C = \{0, 5, 7, 9\}$ $\Rightarrow$ $(1\,0\,0\,0\,0\,1\,0\,1\,0\,1)$