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Homework 14
Mathematics 2216.01
Due October 19, 2022

1. Prove or give a counterexample:

(a) $A \setminus (B \cap C) = (A \setminus B) \cup (A \setminus C)$.

(b) $(A \setminus B) \cup B = A$.

(c) $A \setminus (A \setminus B) = B$.

(d) $A \setminus (B \setminus A) = A \setminus B$.

(e) $(A \cap B) \cup (A \setminus B) = A$.

To give a counterexample, you must give specific sets A and B that make the statement false.

2. Prove that if $\zeta \in \mathbf{C}$ satisfies both $\zeta^a = 1$ and $\zeta^b = 1$ then

$$\zeta^{\gcd(a,b)} = 1.$$