

Math 18000 Midterm 1 Review

September 27, 2026

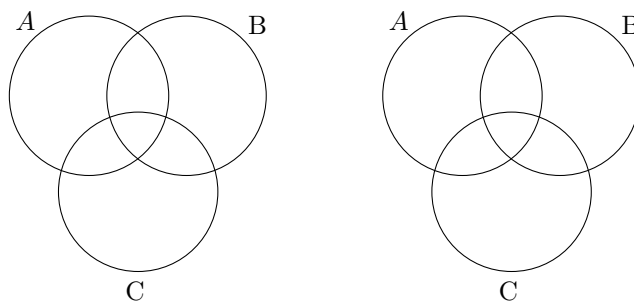
Question 1: Give a counterexample to the principle

$$\text{If } a < b \text{ then } ac < bc$$

Question 2:

Convert 10110_2 from binary into base 8.

Question 3:



- (a) In the left diagram, shade in the region $(A \cap B) \cup (B \cap C)$
- (b) In the right diagram, shade in the region $(A \cup B) \cap (A \cup C)$

Question 4:

- (a) Does 3 divide 14,213?
- (b) Does 8 divide 41,648?

Question 5:

Consider the sets $(A - B) \cap (C - A)$ and $\overline{B} \cap C$. Is one a subset of the other?

Question 6:

- (a) Convert 242 (in base 10) into binary
- (b) Compute $110_2 \times 1001_2$. Write your answer in binary
- (c) Compute $321_4 + 121_4$. Write your answer in base 4.