Mathematics 300 Homework, September 11, 2024.

For the quiz on Friday know the following

Definition 1. If m and n are integers and $m \neq 0$, then m ***divides*** n if and only if there is an integer q such that $m = qn$.

Definition 2. If a and b are integers and n a natural number, then $a \equiv b \pmod{n}$ provided there is an integer q such that $a - b = qn$. □

Problem 1. True or false $512 \pmod{3}$. Explain your answer.

Solution. False. We have $5 - 12 = -7$ and 3 does not divide -7 so 5 and 12 are not congruent modulo 7. □

Problem 2. True or false $-3 \equiv 4 \pmod{7}$. Explain your answer.

Solution. True. We have $-3 - 4 = -7$ and -7 us divisible by 7. Therefore -3 is congruent to -4 modulo 7. □