

1. [**4 points**] Find the quotient q and remainder r when a is divided by b in each of the following cases:
 - (a) $a = 20, b = 7$
 - (b) $a = -12, b = 5$
2. [**6 points**] Determine if the following statements are **true** or **false**, using the definition of congruence modulo n to justify your answer.
 - (a) $74 \equiv_9 85$
 - (b) $52 \equiv_{13} 0$
 - (c) $-5 \equiv_3 34$
3. [**10 points**] Use modular arithmetic to determine the remainder when 8^{24} is divided by
 - (a) 3
 - (b) 5