

Name: _____

Please show all work and justify your answers.

1. Expand decimal 151 in binary, octal and hexadecimal. What is the decimal expansion of hexadecimal BAD?
2. Apply Euclid's algorithm to 74 and 35 to show that they are co-prime. Find the Bézout coefficients.
3. Use the Chinese remainder theorem to solve the following system of congruences:

$$x \equiv 2 \pmod{4}, \quad 2x \equiv 3 \pmod{5}, \quad x \equiv 1 \pmod{9}.$$

4. For which $n \geq 0$ is $4^n < n!$? Prove your assertion.
5. What amounts can be obtained with only \$5 and \$2 bills? Prove your assertion.

1	2	3	4	5	total (50)	%