quiz 06.1

(1) Find the ones'-place digit of 7^{103}.

(2) Factor $2^{24} - 1 = 16777215$ *gracefully* (meaning using high-school algebra identities to find several large factors as the beginning, which has the effect of making clear *before* any computations are done that the run-time will be small).

(3) Explain why $(n-3)(n-5)$ is not prime for any $n \geq 7$.

(4) Efficiently find the greatest common divisor of $5^{56} - 1$ and $5^{72} - 1$.