Rob Gross
Homework 27
Mathematics 2216.01
Due November 30, 2022

1. Let F be a field. Remember that two polynomials $f(x), g(x) \in F[x]$ are *associates* if $f = \lambda g$, where $\lambda \in F^\times$. We write $f \sim g$ if f and g are associates.
   Show that this is an equivalence relation.

2. In $\mathbf{Z}/11\mathbf{Z}[x]$, use the Euclidean algorithm to compute a greatest common divisor $d(x)$ of

$$a(x) = x^3 + 3x^2 + x + 1$$
$$b(x) = x^3 + 4x^2 - 1$$

and find polynomials $s(x), t(x) \in (\mathbf{Z}/11\mathbf{Z})[x]$ such that

$$a(x)s(x) + b(x)t(x) = d(x).$$

You do not need to show me your work for each step of long division.