

CS 557
Homework 13
Due Tuesday, 27 October 2009

1. Use Euclid's algorithm to find the GCD and common roots of

$$f(t) = -2 + 5t - 2t^2 - 2t^3 + t^4$$

$$g(t) = 2 - 5t + 6t^2 - 4t^3 + t^4$$

2. The GCD of $f(t)$ and $f'(t)$ indicates the double roots of $f(t)$. Find the double roots of

$$f(t) = t^3 - 5t^2 + 8t - 4$$

by computing the GCD of $f(t)$ and $f'(t)$.

3. Find the absolute value of the GCD of the two polynomials

$$f(t) = (t - 1)(t - 3)(t - 5); \quad g(t) = (t - 2)^4$$

4. Find the resultant of the two polynomials $f(t) = 2t^2 + 3t - 5$ and $g(t) = t^2 - 4t + 3$. Do these two polynomials have a common root?

5. A cusp on a parametric curve is a point for which $x' = y' = 0$. Is there a cusp on the following curve?

$$x = 2t^3 - 9t^2 + 12t - 1, \quad y = t^3 - 6t^2 + 9t - 2$$

If so, where?