

Math 499 Exercises

March 16, 2005

1. Prove Properties 7 and 8 using Properties 1-6.
2. How many times do the two given curves intersect at the origin?
 - (a) $y = x^3$ and $y^4 + 6x^3y + x^8 = 0$
 - (b) $y = x^2 - 2x$ and $y^2 + 5y = 4x^3$
 - (c) $y^2 + x^2y - x^3 = 0$ and $y^2 + x^3y + 2x$
 - (d) $y^5 = x^7$ and $y^2 = x^3$
 - (e) $xy^4 + y^3 = x^2$ and $y^5 + x^2 = xy$
3. Let C and D be two circles through the origin, and assume that the center of C lies in the x -axis. Prove that C and D intersect either or once at the origin, depending on whether or not the center of D lives on the x -axis.
4. Prove that if $\deg(f) = m$ and $\deg(g) = n$, then $I_O(f, g) \leq mn$.