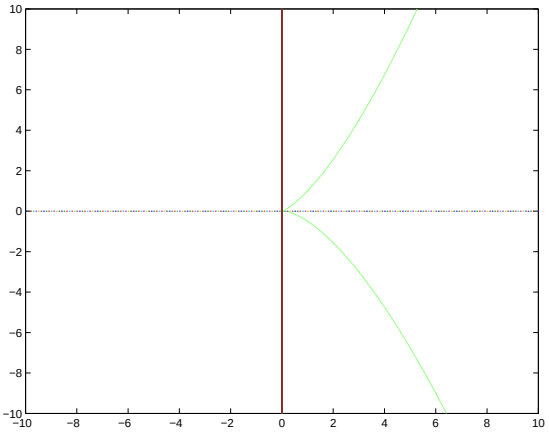
Quiz for section 4.4, 4.8, 4.9

November 17, 2003

Problem 1 The Cissoid of Diocles is the solution set of

$$x^3 + xy - 2y^2 = 0 \tag{1}$$

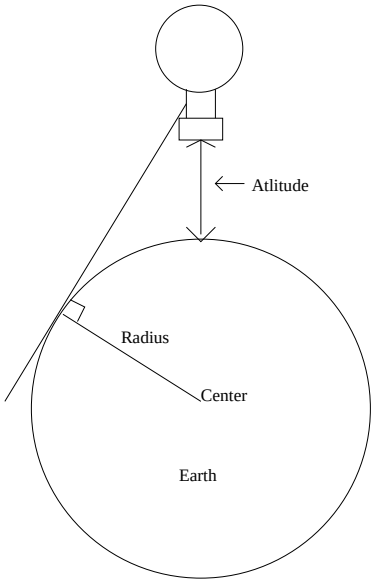
It looks like:



Find the equation for the tangent line to the Cissoid at the point (1,1).

Problem 2 Using differentials, estimate $\cos(28\,^\circ)$.

Problem 3 A man in a hot-air balloon is ascending at a rate of 10ft/sec. How fast is the distance from the horizon increasing when the balloon is 1,000 feet high? Assume the earth's radius is 4000 mile.



Problem 4 Calculate the differentials:

(a) $d\left(\sqrt{1-x^2}\right)$

(b) $d\left(\frac{1}{sin^3(x)}\right)$

(c) $d\left(\frac{x+1}{x-1}\right)$