Review Exercises: Due Monday, February 26

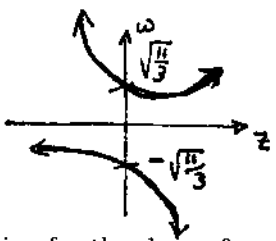
1. Find $\frac{dy}{dx}$.

$$5x^3 + x^2y - (2x + 7y)^3 = 0$$

$$(2x + 5)^2(2y^3 + 7) = 2^x$$

$$\sqrt{(3x^2 + 4xy^2)} + 7xy = 2e^{2x+5}$$

$$2e^{3xy} + \ln\left((3x^2 + 5)y^3\right) = (2x)^2 + y^3$$



2. Find the tangent line to the hyperbola

$$3w^2 + 2wz - 5z^2 = 11$$

at the point $(z, w) = (1, 2)$. Can you find a general expression for the slope of the tangent line to the hyperbola?

Examine the expression you obtained. Is it always well-defined? Can you explain your answer in terms of the graph? Answer the same questions for the ellipse

$$3w^2 + 2wz + 2z^2 = 18$$