7. [14 points] The *Kampyle of Eudoxus* is a family of curves that was studied by the Greek mathematician and astronomer Eudoxus of Cnidus in relation to the classical problem of doubling the cube. This family of curves is given by

$$a^2 x^4 = b^4(x^2 + y^2).$$

where a and b are nonzero constants and $(x, y) \neq (0, 0)$—*i.e.*. the origin is not included.

a. [5 points] Find $\dfrac{dy}{dx}$ for the curve $a^2 x^4 = b^4(x^2 + y^2)$.

b. [5 points] Find the coordinates of all points on the curve $a^2 x^4 = b^4(x^2 + y^2)$ at which the tangent line is vertical, or show that there are no such points.

c. [4 points] Show that when $a = 1$ and $b = 2$ there are no points on the curve at which the tangent line is horizontal.