Homework 7, Graded Problems, M170-001

1. Find all locations on
\[ y = \frac{x^2}{1-x} \]
where the tangent slope is 1. (x-coordinates are sufficient.)

2. Where in the interval [0, 2\pi] does \( y = \sin^2 x - \sin x \) have a horizontal tangent? (x-coordinates are sufficient.)

3. An object moves up and down so that its height (in feet) after \( t \) seconds is given by
\[ h(t) = 2 + 1.3 \cos(3.2t - 0.7) \]
Find all times in the interval [0,1] when its velocity is 2.08 feet per second.

4. The ellipse pictured below is given by \( x^2 + 9y^2 = 81 \), and the tangent line has \( y \)-intercept exactly at 6. Find the exact \( x \)-intercept. [Hint: first find the point of tangency.]