Math 4 Honors Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit 7 Test Review Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 1. In the bottom of an hourglass a conical pile of sand is formed at the rate of 12 cubic inches per minute. The radius of the base of the pile is always equal to 1/2 its altitude. How fast is the altitude rising when it is 6 inches deep?

 2. A balloon is rising vertically above a level, straight road at a constant rate of 1 ft./sec. Just when the balloon is 65 feet above the ground, a bicycle moving at a constant rate of 17 ft./sec. passes under it. How fast is the distance between the bicycle and balloon increasing 3 seconds later?

 3. For each of the following find .

 a.  d. 

 b.  e. 

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 c.  f. 

 4. Write the equation of the tangent line at the point (1, 0) for the equation in #3b.

 5. 

 a. Find the *x*-intercept.

 b. Find the vertical asymptote.

 c. Find *f* '(*x*).

 d. What are the maximum and minimum points (if any)?