**Math 3A Calculus Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Test 3**

1. A plane flying horizontally at an altitude of 7 mi and a speed of 480 mi/h passes directly over a radar station. Find the rate at which the distance from the plane to the station is increasing when it is 8 mi away from the station.

2.Use a linear approximation or differentials to estimate to four decimal places. You must show work to earn credit.

3. Find the differential of the function .

4. Find the derivative of.

5. Given, find the absolute maximum and absolute minimum values on the interval 

6. Given, use derivatives to:

a. find the intervals on which y is increasing and decreasing. You must show work to earn credit.

b. find the local maximum and minimum values of y. You must show work to earn credit.

7. Given,use derivatives to:

a. find the intervals of concavity. You must show work to earn credit.

b. find the inflection point(s). You must show work to earn credit.

8. Find the number c that satisfies the conclusion of the Mean Value Theoremon the interval [1, 7].

9. Find the limits using l’Hospital’s Rule. You must show work to earn credit.

a. 

b. 

10. If 2028 cm2 of material is available to make a box with a square base and an open top, find the largest possible volume of the box.