Related Rates and Linearization

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

1) A rectangular swimming pool 18 m by 10 m is being filled at the rate of 0.6 m^3/min. How fast is the height h of the water rising? 1) _____

2) A piece of land is shaped like a right triangle. Two people start at the right angle at the same time, and walk at the same speed along different legs of the triangle while spraying the land. If the area covered is changing at 3 m^2/s, how fast are the people moving when they are 5 m from the right angle? (Round approximations to two decimal places.) 2) _____

3) One airplane is approaching an airport from the north at 203 km/hr. A second airplane approaches from the east at 300 km/hr. Find the rate at which the distance between the planes changes when the southbound plane is 32 km away from the airport and the westbound plane is 16 km from the airport. 3) _____

Find the linearization L(x) of f(x) at x = a.

4) $f(x) = 4x^2 - 2x + 5, a = 2$ 4) _____

5) $f(x) = \sqrt{8x + 9}, a = 0$ 5) _____

6) $f(x) = x + \frac{1}{x}, a = 3$ 6) _____