4.4 Introduction to Related Rates

Calculus Name: _____ **CA #1**

Find a relationship between the given rates of change by doing the following.

1. **Set up a relationship using variables for the situation.**
2. **Differentiate with respect to time t.**

1. A baseball diamond has the shape of a square. A player is running from first to second base. Relate the rate at which the distance between the runner and home plate is changing with the rate of the base runner.

2. An airplane is flying at a steady altitude and passes directly over a radar antenna. Relate the rate of change of the horizontal distance between the antenna and the plane with the direct line of sight distance.

3. A balloon rises into the air from a point on the ground 10 meters from an observer. Relate the rate of change of the angle of elevation of the balloon from the observer and the distance between the observer and the balloon.

Answers to 4.4 CA #1

Variables may differ from your answers.

1. $a\frac{da}{dt} = c\frac{dc}{dt}$	2. $x\frac{dx}{dt} = z\frac{dz}{dt}$	3. $\sin\theta\frac{d\theta}{dt} = \frac{10}{c^2}\frac{dc}{dt}$