Math 220 (section AD?) **Quiz 6** **Spring 2015**

Name _____

- You have 15 minutes
- No calculators
- Show sufficient work

1. (4 points) A plane flies horizontally at an altitude of 6 km and passes directly over a tracking telescope on the ground. When the angle of elevation is $\pi/6$ rad, this angle is decreasing at a rate of 0.5 rad/min. How fast is the plane traveling at that time?

2. (4 points) A rock is thrown vertically upward from the surface of a planet. The rock's height above the planet's surface is given by the equation $s = t(24 - 1.2t)$, where t is measured in seconds and s is measured in meters.

   (a) Find a formula for the rock's velocity at time t.

   (b) What is the maximum height reached by the rock?

3. (2 points) Solve the following differential equations given that the graph of each solution goes through the point $(2, 16)$. You must use the given variables.

   (a) $\dfrac{dv}{dr} = 6v$

   (b) $\dfrac{dv}{dr} = 10r$