

Math 241: HW 10

Due on Wednesday, October 2

Fall '13

John "Curlee" Robertson

Problem 1

Danny Devito (or any person of negligible height) flies a kite at a height of 300ft (Danny can do this because he has magic kite flying powers), and the wind is carrying the kite horizontally away from him at a rate of 25ft/sec. How fast must he let string out (to keep the kite at a constant height) when the kite is 500ft away from him (meaning there is 500ft of string out)? At what rate is the angle between the string and the ground changing at this moment?

Problem 2

A spherical balloon is inflated with helium at the rate of 100π cubic feet per minute. How fast is the balloon's radius increasing at the instant the radius is 5ft? How fast is the surface area increasing at this time?

Problem 3

A light house is located on an island 5km away from the nearest point, P , on a straight shoreline. It's light makes 6 revolutions per minute. How fast is the beam of light moving along the shoreline when it is 2km away from P . (There seemed to be a bit of confusion in class on the set-up of this problem. Think of the situation viewed from above: The island is 5km away from the shore, the light (from the light house) is running across the beach. Depending on how far the light on the beach is away from P , it will be going a different speed. We desire to know how fast it is going when it's 2km away from P (in either direction, it will be the same).)

Problem 4

Problems 14, 22, 24, 27, 30, 31 in section 3.7 should be done as well but will not be collected. Some of them are slightly challenging.