

General Instructions:

- Due 3/3/2008
- Please label your paper so I understand what sections are being answered!
- Show your work so I can follow it.
- E-mail preferred; paper copy is ok. Text should be word-processed – but it's ok to hand-draw graphs **if they are neat.**
- There's a lot of work – teams will probably have an easier time! Teams of up to 3 members are allowed.
- Include names of all team contributors on the 1st page **and in the name of any file you send me by email.**

Oil Spill An oil tanker strikes a sand bar that rips a hole in the hull of the ship. Oil begins leaking out of the tanker, with the spilled oil forming a circle around the tanker. The radius of the circle is increasing at the rate of 2.2 feet per hour.

- Write the area of the circle as a function of the radius r .
- Write the radius of the circle as a function of time t .
- What is the radius of the circle after 2 hours? What is the radius of the circle after 2.5 hours?
- Use the result of part (c) to determine the area of the circle after 2 hours and 2.5 hours.
- Determine a function that represents area as a function of time t . Graph the function
- Use the result of part (e) to determine the area of the circle after 2 hours and 2.5 hours. Label those points on the graph.
- Compute the average rate of change of the area of the circle from 2 hours to 2.5 hours.
- Compute the average rate of change of the area of the circle from 3 hours to 3.5 hours.
- Based on the results obtained in parts (g) and (h), what is happening to the average rate of change of the area of the circle as time passes?
- If the oil tanker is 150 yards from shore, when will the oil spill first reach the shoreline? (1 yard=3 feet)
- How long will it be until 6 miles of shoreline is contaminated with oil? (1 mile=5280 feet). Include a diagram as part of your work.