RELATED RATES

MATH 101E - CALCULUS & SAILING - FALL 2008

(1) Two boats start sailing from the same point. One sails south at 5 mph while the other sails east at 7 mph. How fast is the distance between them changing after 30 minutes?

(2) page 131, #10

(3) At 9am ship A is 50km east of ship B. Ship A is sailing north at 40km/h and ship B is sailing south at 30km/h. How fast is the distance between them changing at noon?

(4) Page 132, #19

(5) A boat is cast off from a dock by a rope attached to the bow of the boat. The point of attachment on the dock is 2 yards above the bow of the boat. If the dock line is being let out at a rate of 0.75 feet per second, how fast is the boat going away from the dock when the boat is 3 yards away?

(6) Page 131, # 18

(7) Two boats start sailing from the same point. One sails east at 7 knots with the other sails northwest at 5 knots. How fast is the distance between the boats changing after 45 minutes?

(8) Page 133, # 36

(9) Two boats start sailing from the same point. One sails at a speed of 5 knots with a heading of E 15° N while the other sails at 8 knots with a heading of S 30° E. After 2 hours, how fast is the distance between them changing?

(10) Page 133: #38

(11) How fast is 1 knot? What are the origins of this unit of speed?