

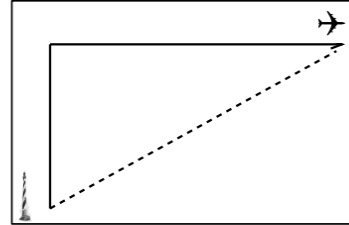
FDWK Sec 4.6 Related Rates

Right Triangle problems

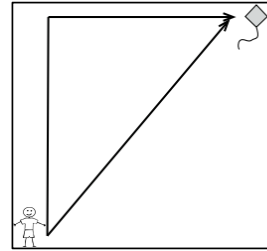
- 5) A 13-foot ladder leans against a vertical wall. If the lower end of the ladder is pulled away at the rate of 2 ft/sec, how fast is the top of the ladder coming down the wall at a) the instant the top is 12 feet above the ground and b) 5 feet above the ground?

- 6) A camera is mounted 3,000 feet from a rocket launching pad. The camera needs to swivel as the rocket is launched to keep it in focus. a) If the rocket is rising vertically at 800 ft/sec when it is 4,000 feet high, how fast is the camera-to-rocket distance changing? b) how fast is the camera's angle of elevation changing at that moment in time?

6. An airplane is in level flight, 6 miles above ground directly over a lighthouse. Sometime later, the distance between the plane and the lighthouse is exactly 10 miles and this distance is increasing at the rate of 400 mph. How fast is the plane traveling?



9. A boy flies a kite that initially is 120 feet directly above him. If the wind carries the kite horizontally at the rate of 30 feet/min, at what rate is the string being pulled out when the length of the string is 150 feet?



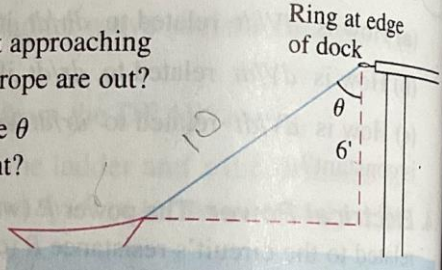
10. The same boy flies the kite that is now 100 feet above the ground. If the string is pulled out at 10 ft/min because the wind carries the kite horizontally away from the boy, what is the rate of change of the angle the kite makes with the vertical when the angle is  $30^\circ$ ?

You Try p 252 # 21

21 **Hauling in a Dinghy** A dinghy is pulled toward a dock by a rope from the bow through a ring on the dock 6 ft above the bow as shown in the figure. The rope is hauled in at the rate of 2 ft/sec.

(a) How fast is the boat approaching the dock when 10 ft of rope are out?

(b) At what rate is angle  $\theta$  changing at that moment?



Overnight, try p 252, 253 Ex 19, 22, 33 If you do not have your copy of the Chapter 4 answers see

