

Part 5

Related Rates

Question 5.1. A cube's surface area increases at the rate of 72 square inches per second. At what rate is the cube's volume changing when the edge length is $x = 3$ inches?

Question 5.2. A 13-ft ladder is leaning against a house when its base starts to slide away. By the time the base is 12 ft from the house, the base is moving at the rate of 5 ft/sec.

- (a) How fast is the top of the ladder sliding down the wall then?
- (b) At what rate is the area of the triangle formed by the ladder, wall, and ground changing then?

Question 5.3. A girl flies a kite at a height of 300 ft, the wind carrying the kite horizontally away from her at a rate of 25 ft/sec. How fast must she let out the string when the kite is 500 ft away from her?