

PROBLEM

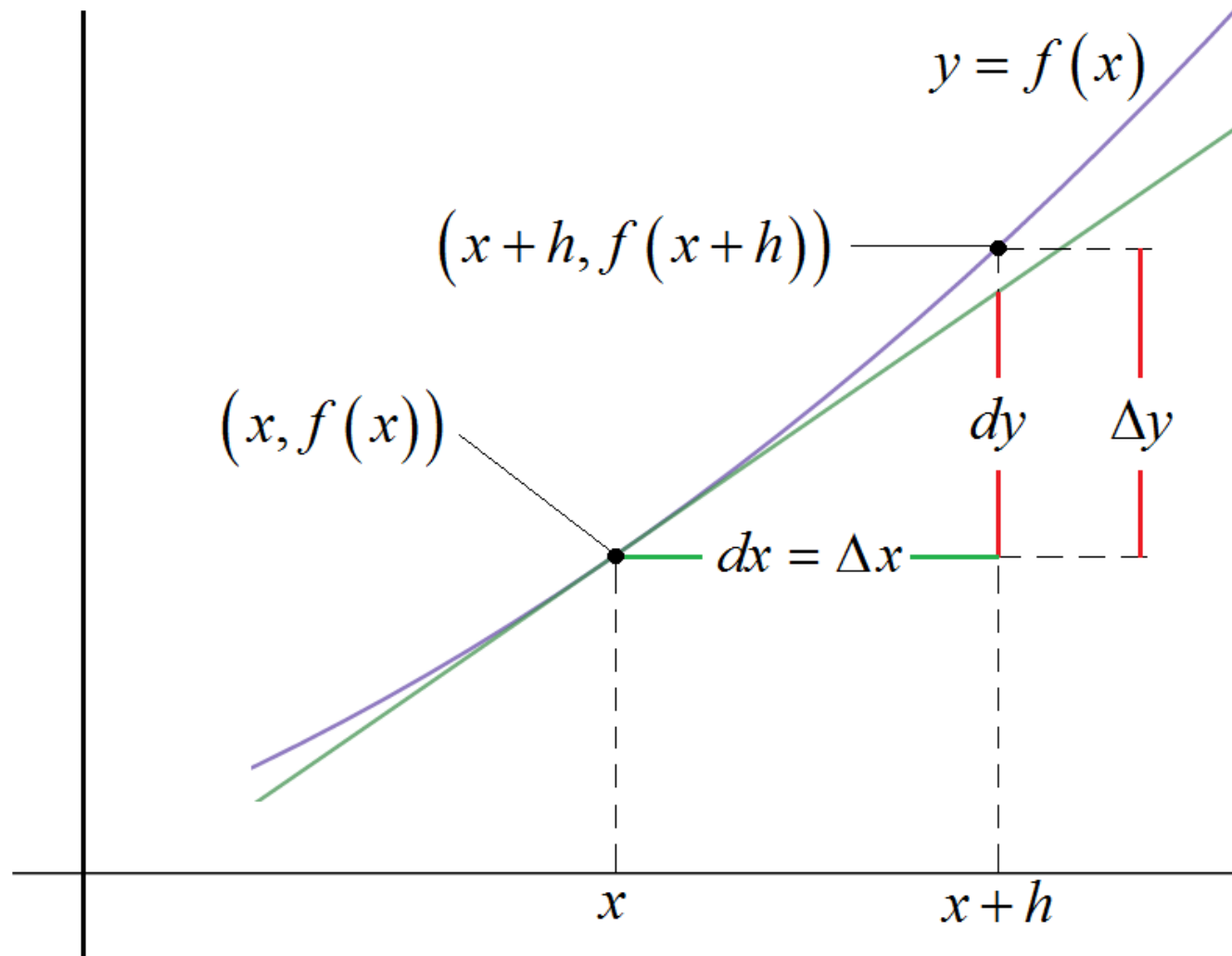
**A MAN WALKS ALONG A STRAIGHT PATH
AT A SPEED OF 4 FT/SEC. A SEARCHLIGHT
IS LOCATED 20 FT ABOVE THE GROUND
AND IS KEPT FOCUSED ON THE MAN. AT
WHAT RATE IS THE SEARCHLIGHT
ROTATING WHEN THE MAN IS 15 FT AWAY
FROM THE BASE OF THE SEARCHLIGHT?**

The background features a light gray gradient with several realistic water droplets of various sizes scattered across the frame. A faint, large circular pattern, possibly a watermark or a decorative element, is visible in the upper center.

LESSON 2.9

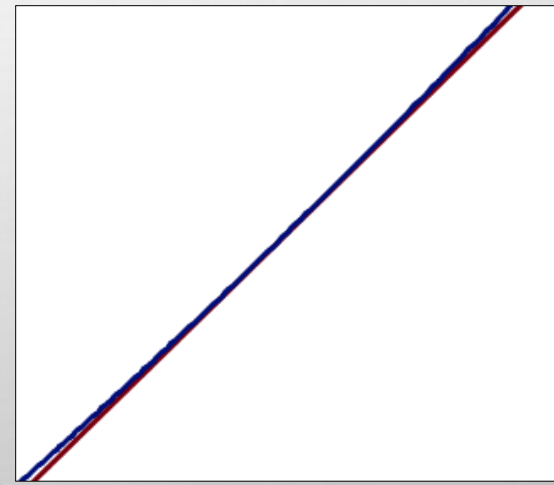
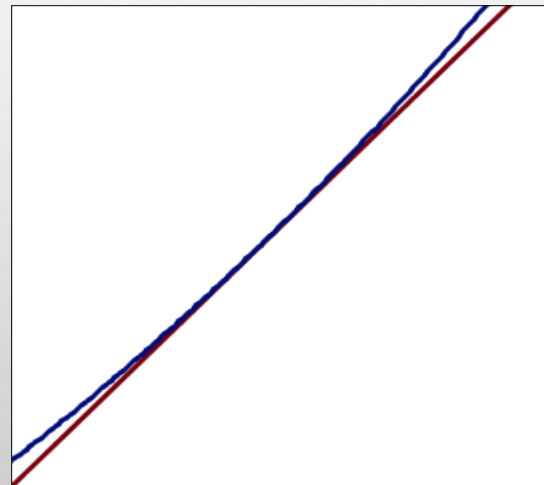
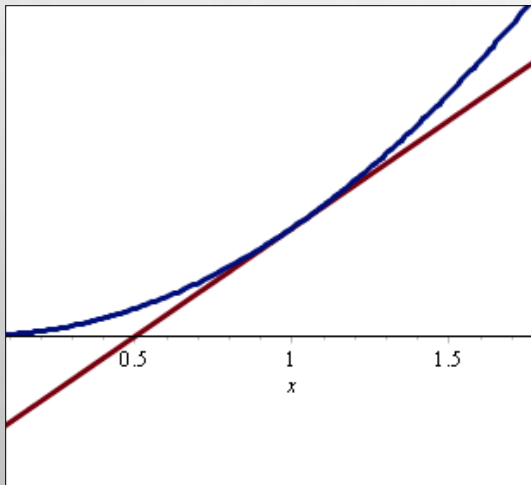
LINEAR APPROXIMATIONS & DIFFERENTIALS

IDEAS/NOTATION



LINEARIZATION

**ANY SMOOTH FUNCTION IS APPROXIMATELY
LINEAR ON A FINE ENOUGH SCALE!**



PROBLEM

THE RADIUS OF A SPHERE WAS MEASURED AND FOUND TO BE 21 CM WITH A POSSIBLE ERROR IN MEASUREMENT OF AT MOST 0.05 CM. WHAT IS THE ESTIMATED MAXIMUM ERROR IN USING THIS VALUE OF THE RADIUS TO COMPUTE THE VOLUME OF THE SPHERE?

