PROBLEM
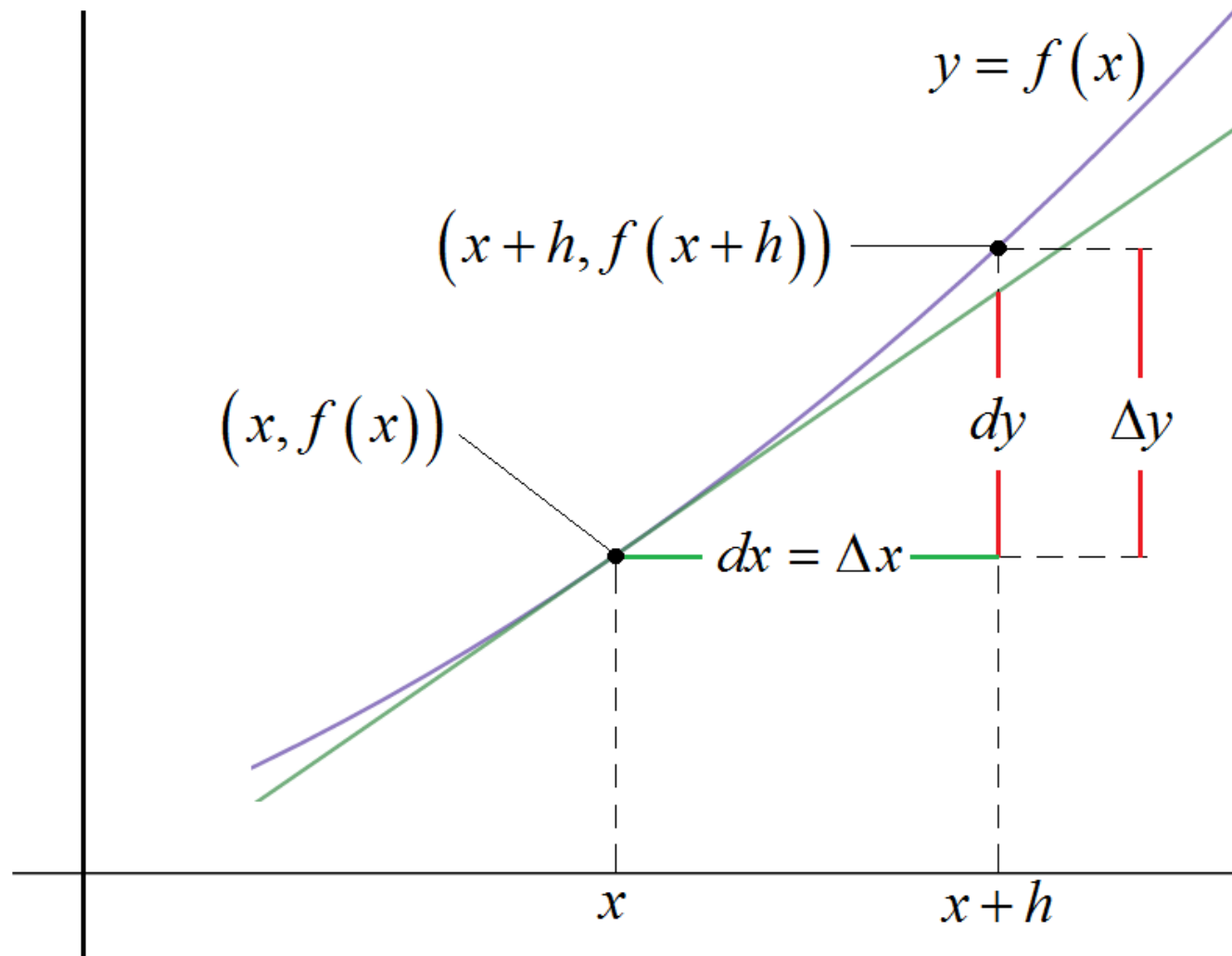
A MAN WALKS ALONG A STRAIGHT PATH AT A SPEED OF 4 FT/SEC. A SEARCHLIGHT IS LOCATED 20 FT ABOVE THE GROUND AND IS KEPT FOCUSED ON THE MAN. AT WHAT RATE IS THE SEARCHLIGHT ROTATING WHEN THE MAN IS 15 FT AWAY FROM THE BASE OF THE SEARCHLIGHT?
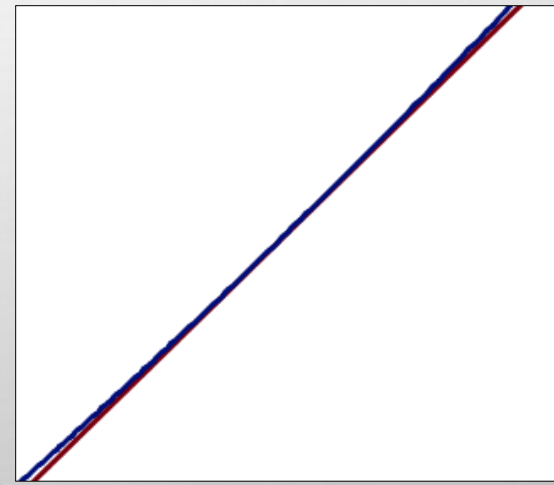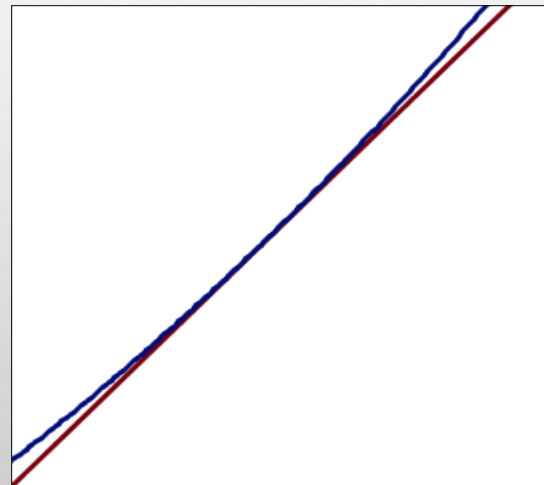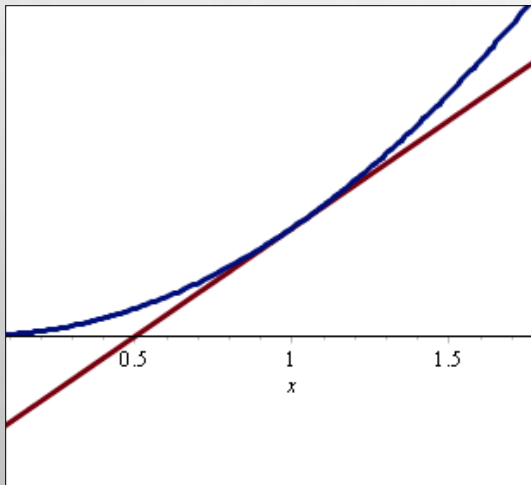
LESSON 2.9

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?