

Worksheet 8

Name:

1. A cable hangs between two poles at $x = a$ and $x = -a$. The shape of the cable is given by $f(x) = a \cosh\left(\frac{x}{a}\right)$. Find an expression (in terms of a) for the *sag*, the difference between the highest and lowest points of the cable.

2. If you fall through a medium so that resistance is proportional to the square of your velocity, then the distance you fall as a function of time is given by $D(t) = k \ln(\cosh(ct))$, where k and c are constants. Assume distance is given in meters and time is measured in seconds.

- (a) Find your velocity at time t .
- (b) What is your limiting velocity?