1. Cost and revenue functions for a charter bus company are shown in the figure above. Should the company add a 50th bus? How about a 90th? Explain your answers using marginal revenue and marginal cost.

Notice that \( MC(49) < MR(49) \) so add 50th bus

However \( MC(89) > MR(89) \) so do not add 90th bus.

The tangent lines approximate the \( MC \), \( MR \) is a constant.

2. A company’s cost of producing \( q \) liters of a chemical is \( C(q) \) dollars; this quantity can be sold for \( R(q) \) dollars. Suppose \( C(2000) = 5930 \) and \( R(2000) = 7780 \).

(a) What is the profit at a production level of 2000?

\[
7780 - 5930 = \$1850
\]

(b) If \( MC(2000) = 2.1 \) and \( MR(2000) = 2.5 \), what is the approximate change in profit if \( q \) is increased from 2000 to 2001? Should the company increase or decrease production from \( q = 2000 \)?

Yes, \( MR(2000) = 2.5 > MC(2000) \)

(c) If \( MC(2000) = 4.77 \) and \( MR(2000) = 4.32 \), should the company increase or decrease production from \( q = 2000 \)?