

These problems are taken from:

<https://www.math.ucdavis.edu/kouba/CalcOneDIRECTORY/maxmindirectory/MaxMin.html>

1. There are 50 apple trees in an orchard. Each tree produces 800 apples. For each additional tree planted in the orchard, the output per tree drops by 10 apples. How many trees should be added to the existing orchard in order to maximize the total output of the orchard?
2. Car B is 30 miles directly east of Car A and begins moving west at 90 mph. At the same moment car A begins moving north at 60 mph. What will be the minimum distance between the cars and at what time t does the minimum distance occur ?
3. A movie screen on a wall is 20 feet high and 10 feet above the floor. At what distance x from the front of the room should you sit yourself so that the viewing angle θ of the movie screen is as large as possible ?