

## Homework 4, EE 458, Fall 2019

As in our examples 1 and 2, let

$$v(x) = 60x - x^2 \quad p = 60 - 2x \quad x(p) = 30 - \frac{p}{2}$$

Recall that in example 2, we computed the consumer surplus at  $p=30$ ,  $x=15$ , to be 225.

- a. How much energy is obtained when  $p=40$ ?
- b. Compute the consumer surplus when the price is 40.
- c. What is the change in consumer surplus when the price is raised from 30 to 40?
- d. Determine the loss due to buying the old amount of energy (15) at the higher price. If the consumer loses this amount of money, who gets it?
- e. Determine the decreased utility due to the decreased purchased amount.
- f. Draw a graph of the inverse demand function and illustrate on it:
  - The loss due to buying the new amount of energy at the higher price;
  - The decreased utility due to the decreased purchased amount;
  - The consumer surplus at the higher price.