Microeconomics Mod19 Comm Prop practice exam questions

(The attached PDF file has better formatting.)

- A town's residents like to fishing at the town pond. Each person values fishing at $547.40 - 0.05 \times N^2$, where N is the number of persons at the pond (including that person).
- People value their time at 110 (per day of fishing), and the expenses of going fishing are zero.

Question 19.1: Net benefit

If the entrance fee for fishing at the town pond is zero, what is the net benefit per person from fishing at the town pond?

Answer 19.1: Each person values fishing at $547.40 - 0.05 \times N^2$, where N is the number of persons at the pond (including that person). People value their time at 110 (per day of fishing), and the expenses of going fishing are zero, so the net benefit per person is $547.40 - 110 - 0.05 \times N^2$.

Question 19.2: Total social welfare

What is total social welfare from fishing at the town pond?

Answer 19.2: total social welfare from fishing at the town pond = the number of persons at the pond × the net benefit per person:

$$(547.40 - 0.05 \times N^2 - 110) \times N = (547.40 - 110) \times N - 0.05 \times N^3$$

Question 19.3: Persons fishing

If the entrance fee for fishing at the town pond is zero, how many persons fish at the town pond?

Answer 19.3: Persons stop coming to fish at the town pond when the net benefit per person is zero:

$$547.40 - 0.05 \times N^2 - 110 = 0$$

$$N = ((547.40 - 110) / 0.05)^{0.5} = 93.53$$

If the entrance fee for fishing at the town pond is zero, 93 persons fish at the town pond, and total social welfare is zero.

Question 19.4: Maximizing total social welfare

To maximize total social welfare, how many persons should fish at the town pond?

Answer 19.4: Set the first derivative with respect to N of total social welfare equal to 0:

$$(547.40 - 110 - 3 \times 0.05 \times N^2) = 0$$

$$N = ((547.40 - 110) / (3 \times 0.05))^{0.5} = 54.00$$

Question 19.5: Entrance fee

The town sets an entrance fee for fishing at the town pond that maximizes social welfare.

What entrance fee maximizes total social welfare?

Answer 19.5: If 54 persons fish at the town pond, the net benefit per person is

$$(547.40 - 110) - 0.05 \times 54^2 = 291.60$$

Persons stop coming to fish at the town pond when the net benefit per person is zero, so the entrance fee must be 291.60.

Question 19.6: Total social welfare

The town sets an entrance fee for fishing at the town pond that maximizes social welfare.

What is the total social welfare with this entrance fee?

Answer 19.6: Total social welfare is $54 \times 291.60 = 15{,}746.40$.

If the entrance fee for fishing at the town pond is zero, 93 persons fish at the town pond, each person fishing has zero net benefit, and the town gets zero entrance fee. With a 291.60 entrance fee, 54 persons fish at the town pond, each person fishing has zero net benefit, and the town gets 15,746.40 entrance fee.