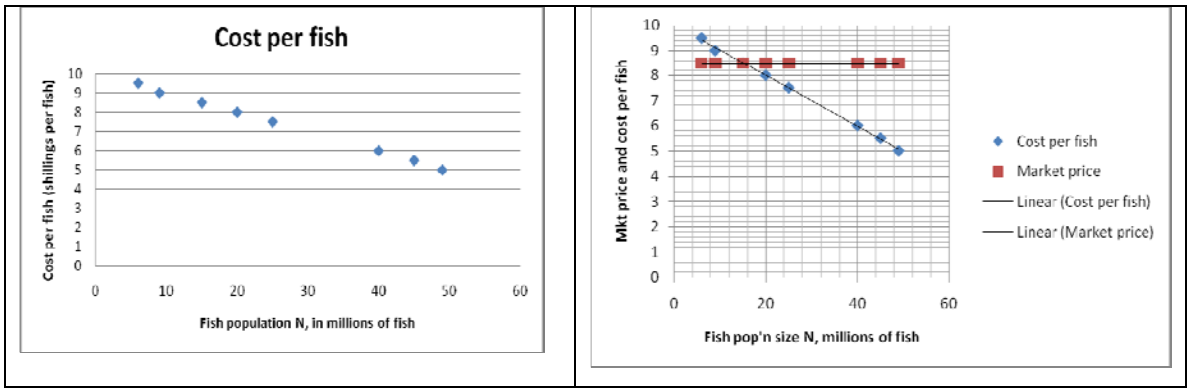
Day 19 MATD 0385 Wed. Mar. 31 Systems, Lesson 4

Go over quiz problems.

Classwork:

In Lesson 2, we talked about the cost and revenue of an entire fishing expedition, so we talked in terms of thousands of fish, which we called "buckets" of fish. And we looked at graphs of the cost and revenue formulas and noticed that often they intersect, and that point at which they intersect is the "break-even" point.

In Lesson 3, we started looking at what happens to the cost per individual fish when the size of the fish population changes. This is called the "Harvest model" because we are talking about the effect of "harvesting" the fish on the profit involved in fishing. Notice that "harvesting" fish changes the size of the population of fish. So that's why our graphs have the size of the fish population on the *x*-axis. Our Activity 1 in Lesson 4 builds on the graph you made in the first quiz problem for today – the graph in page 28, problem 1.



So, looking at the above graph, if you were a fisherman, do you want to be in business when the fish population is 40 million fish? Why?

What about if the fish population is 5 million fish? Why?

How would you define profit here? What is the profit per fish if the fish population size is 40 million?

Do Activity 1, using the graphs above.

Question 3: Finish this table:

N	Market price	Cost per fish	Profit per fish
49	8.5	5	
45	8.5	5.5	
40	8.5	6	
25	8.5	7.5	
20	8.5	8	
15	8.5	8.5	
9	8.5	9	
6	8.5	9.5	

Do you see that the profit is negative for the last two values of fish pop'n size in the table?
Did you get this answer for number 4? 9,250 shillings

Do Activity 2. After you answer questions 1-4, you have mentioned the things that cause the intersection point here to be called an "equilibrium point."
Problem 6 is a very interesting question. When you impose a tax on each fish, then that is essentially a new cost, so that raises the cost per fish. Explain the Figure 4.6 to each other. Then answer Question 6.

Homework: 1, 2, 3, 4, 5, 6, 7, 8.

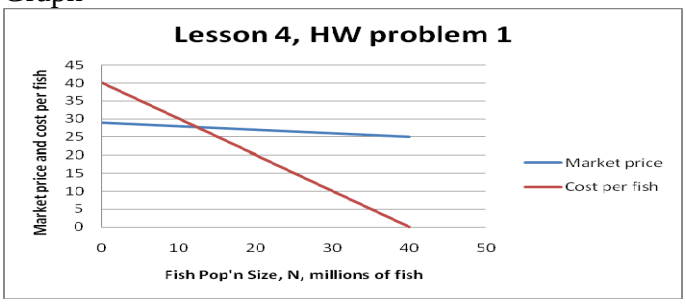
Quiz: Lesson 4. Pages 38-39. 9, 10, 11.
(For problem 11, notice that the cost per fish graph passes through the points (10,9) and (50,5). You can use any of the points it passes through to find the equation, but I am helping you here by identifying some of them.)

Answers to Activity 2.

1. He loses money because the cost to harvest is greater than the market price.
2. He makes money because the cost to harvest is less than the market price.
3. Making a profit would encourage fishing, causing more fish to be caught and thus reducing the fish population. That causes the cost per fish to rise and so the profit goes down.
4. Operating at a loss should discourage fishing, which causes fewer fish to be caught, thus causing the fish population size to increase. That causes the cost per fish to decrease so the profit increases.
5. Agree. On both sides of the intersection point, market forces seem to push inward, toward the intersection point.
6. The tax will raise the cost of the fish, which makes it harder for the fisherman to make a profit, so fewer fish will be caught. On the graph, it makes the cost line higher. That moves the equilibrium point to the right, which means it is at a higher fish population.

Answers to the homework questions which aren't answered in the back of the book.

1. Graph



2. Answer is in the book
3. About $17
4. Profit is about $20/fish, or $20,000 total.
5. Profit is about -$2 per fish, or a loss of $2000 total.
6. Answer is in the book.
7. $p = -0.1N + 29$ and $c = -N + 40$
8. $N \doteq 12.22$ million fish, $p \doteq \$27.78$, $c = \$27.78$