



Problem of the Week

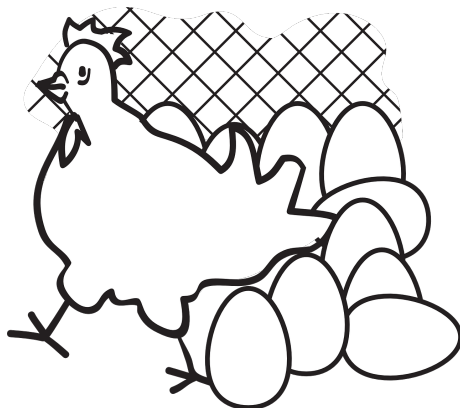
Problem B and Solution

A Chicken and Egg Problem

Problem

Kamini raises chickens in her backyard, which lay an average total of 7 eggs per day. She has three customers who buy a dozen eggs from her each week, paying \$5 per dozen. She keeps the remaining eggs for herself.

- How many eggs per week should Kamini expect to keep for herself?
- If the chickens continue to lay the same average number of eggs throughout the year and the customers continue to buy the same weekly amount, how much money can Kamini expect to make in one year?
- Chickens normally lay eggs for about four years. However, they do not lay eggs while moulting (losing then regrowing their feathers), which they do for 6 to 12 weeks per year. If Kamini's chickens maintain laying an average total of 7 eggs per day throughout the four years, except when they are moulting, and the customers continue to buy the same weekly amount, what is the maximum amount of money Kamini could make over those four years?



Solution

- Since her chickens lay 7 eggs per day for 7 days a week, Kamini can expect $7 \times 7 = 49$ eggs per week.
Since she has 3 customers that each buy 12 eggs per week, she has $3 \times 12 = 36$ eggs going to customers each week.
Thus, there are $49 - 36 = 13$ eggs left for Kamini to keep for herself each week.
- Each week she sells a dozen eggs at \$5 per dozen to 3 customers, so earns $3 \times \$5 = \15 each week.
Since there are 52 weeks in a year, in one year Kamini can expect to make $52 \times \$15 = \780 .
- Kamini would make the maximum amount of money if the chickens only moult for 6 weeks in a year. So the chickens will be producing eggs for $52 - 6 = 46$ weeks each year.
Thus, the amount she would make in one year is $46 \times \$15 = \690 . And the amount she would make in 4 years would be $4 \times \$690 = \2760 .
Thus, Kamini could make a maximum of \$2760 over those 4 years.