IIT Madras

ONLINE DEGREE

Mathematics for Data Science 1
Week 07 - Tutorial 03

In this question Saraswati bought an 8 gram gold chain for rupees 40000, so we can presume that 1 gram is 5000 rupees on first November. And after 10 months that is August 2021, she sold the chain and bought a new 10 gram gold chain by paying an additional 10000 rupees. Suppose, the rate of the gold per gram is denoted by $G(t)$ and it is a function of time $G(t)$ is given to be this cubic polynomial here and we are taking t is to be 0 at the time when Saraswati bought her first gold chain. So, t is a number of months since her buying her first gold chain.

Now, what is the when $G(t)$ is a polynomial of the rate for both used and new good. So, all gold has the same rate as what we are considering and what is the rate of gold per gram when she sold her first chain. So, after 10 months at $t = 10$ is what we are really looking for. So, that means we are looking for $G(10)$ and that gives us $0.07 \times 1000 - 1.4 \times 100 + 7 \times 10 + 5$ and this is $70 - 140 + 70 + 5$. So, that is actually 5. So, the rate is back to 5000 per gram. So, it is again rupees 5000 per gram.

Now, if she had sold the first gold chain after 6 months how much extra would she have paid for buying the 10 grams gold chain? So, after 6 months we have to find the price, the rate, so that would be $G(6)$ and that is 0.07×6^3 is $216 - 1.4 \times 36 + 7 \times 6 + 5$. And then we get this is $15.12 - 1.4 \times 36 = 50.4 + 42 + 5 = 42 + 5 = 47 + 15.12 = 62.12$ that is $62.12 - 50.4 = 11.72$ that would give us then the rate is 11720 rupee per gram. And Saraswati is selling 8 grams at this price that would mean she basically has to pay for the additional 2 gram and that would be 2×11720 which is equal to rupees 23440, this is how much she pays extra for her 10 gram gold chain.