Problem

a) The skin of an orange has a mass of about $\frac{1}{8}$ of the total mass of the orange. If you buy a 3 kg bag of oranges costing $ 0.99 per kg, about how much are you paying for the peel? For the fruit itself?

b) A school cafeteria uses 8 bags of oranges per month. One month, the price per bag varies as follows: for week 1, it is $ 0.99 per kg; week 2, $ 0.97 per kg; week 3, $ 1.02 per kg, and week 4, $ 0.95 per kg. For the cheapest total cost, should the manager have bought all 8 bags the first week, or 2 bags per week over the month?

c) What other costs might be involved that would affect the 'best' choice in part b)? Would your answer change?

Hints

Part a)

Hint 1 - What is the total cost of the bag of oranges?

Part b)

Hint 1 - What is the cost of buying 2 bags per week over the month?

Solution

2 a) The total cost of the bag is \$0.99 x 3 = \$2.97. Since $\frac{1}{8}$ of the total cost is for the peel, the peel costs $\frac{1}{8} \times \$2.97 = \$0.37125 \approx \$0.37$. Thus the fruit itself costs $\approx \$2.60$.

2 b) The cost to buy 2 bags per week over the month is

$$2 \times \$0.99 + 2 \times \$0.97 + 2 \times \$1.02 + 2 \times \$0.95 = \$7.86\,.$$

The cost to buy 8 bags the first week is $8 \times \$0.99 = \$7.92\,.$ Thus it is less expensive to buy the bags weekly.

2 c) If tansportation costs, and the extra time required for four trips are considered in the decision, then the 6 cents difference is not enough to warrant buying the bags weekly.