

Sales Discount Trickery Worked Solution

Question 1

Let's apply the first 50% discount to the price first:

$$\text{Price after 50\% discount} = (1 - 0.5) \times \$35990$$

$$\text{Price after 50\% discount} = \$17995 \quad (1 \text{ mark})$$

Then we apply the second 4% discount to this already reduced price:

$$\text{Price after 4\% discount} = (1 - 0.04) \times \$17995$$

$$\text{Price after 4\% discount} = \$10797 \quad (1 \text{ mark})$$

The correct sale price should be \$10797.

Question 2

Carl adds the two percentage discounts together first:

$$\text{Overall discount} = 50\% + 45\%$$

$$\text{Overall discount} = 95\% \quad (1 \text{ mark})$$

Then he uses it to calculate what he thinks the ring price should be:

$$\text{Carl's ring price} = (1 - 0.95) \times \$35990$$

$$\text{Carl's ring price} = \$1799.50 \quad (1 \text{ mark})$$

Question 3

Will's potential profit is the amount he can pawn the ring for less the amount he pays Carl.

$$\text{Will's profit} = \text{pawn fraction} \times \text{correct sale price} - \text{Carl's price}$$

$$\text{Will's profit} = 0.8 \times \$10797 - \$1799.5$$

$$\text{Will's profit} = \$6838.10 \quad (1 \text{ mark})$$

Will stands to make a nice \$6838.10 in profit, even though he will pawn the ring at less than its real value.

Question 4

After discounting the ring by 70%, the nominal price is now 30% of the original price. When Carl mucks up the discount calculation, he ends up selling the ring for only 5% of the original price.

To get to an overall discount of 95%, we need to be left with a price that is only $(100 - 95) = 5\%$ of the original price.

So we need to get from the intermediate price of 30% to a final price of 5% - which is dividing by 6
(1 mark)

To get from 70% of the original price to 5% of the original price, the second discount must be:

$$\text{Second discount} = 1 - 0.05 / 0.3$$

$$\text{Second discount} = 83.3\% \quad \mathbf{(1 \text{ mark})}$$

The second discount would have to have been 83.3% in order to reach the overall 95% discount.

We can check this works:

Start with 100% priced item

Apply the first 70% discount

Item is now worth 30%

Apply the second discount – take away 0.833 times 30%

Final combined price = 5%

Final discount = 100% - 5% = 95%