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# SALES DISCOUNT TRICKERY WORKED

## SOLUTION

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### Question 1

Let's apply the first 40% discount to the price first:

$$\text{Price after 40\% discount} = (1 - 0.4) \times \$31999$$

$$\text{Price after 40\% discount} = 19,199.40 \text{ (1 mark)}$$

Then we apply the second 50% discount to this already reduced price:

$$\text{Price after 50\% discount} = (1 - 0.5) \times \$19,199.40$$

$$\text{Price after 50\% discount} = \$9599.70 \text{ (1 mark)}$$

The correct sale price should be \$9599.70.

### Question 2

Carl adds the two percentage discounts together first:

$$\text{Overall discount} = 40\% + 50\%$$

$$\text{Overall discount} = 90\% \text{ (1 mark)}$$

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

$$\text{Carl's ring price} = (1 - 0.9) \times \$31999$$

$$\text{Carl's ring price} = \$3199.90 \text{ (1 mark)}$$

### Question 3

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

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

$$\text{Will's profit} = 0.5 \times 9599.7 - \$3199.9$$

$$\text{Will's profit} = \$1599.95 \text{ (1 mark)}$$

Will stands to make a nice \$1599.95 in profit, even though he will pawn the ring at much less than its real price.

### Question 4

After discounting the ring by 40%, the nominal price is now 60% of the original price. When Carl mucks up the discount calculation, he ends up selling the ring for only 10% of the original price.

To get to an overall discount of 90%, we need to be left with a price that is only  $(100 - 90) = 10\%$  of the original price.

So we need to get from the intermediate price of 60% to a final price of 10% - which is dividing by 6 **(1 mark)**

To get from 60% of the original price to 10% of the original price, the second discount must be:

$$\text{Second discount} = (1 - 0.0 \div 0.6)$$

$$\text{Second discount} = 83.33\% \quad \textbf{(1 mark)}$$

The second discount would have to have been 83% in order to reach the overall 90% discount mistakenly offered by Carl.

