YOU & MATHS Tim buys apples at three for $ 1. He resells them at five for $ 2. Assuming that he resells every apple that he buys, how many apples must Tim buy in order to make a profit of $ 10?

A 75   **B** 150   **C** 225   **D** 300   **E** 375

(USA *University of South Carolina: High School Math Contest*, 2005)

Let's call n the number of apples Tim buys.

Three apples cost 1 $, so the cost of n apples is $\$ \frac{n}{3}$.

By selling five apples Tim earns 2 $, so the gain from selling n apples is $\$\left(2 \cdot \frac{n}{5}\right)$.

Tim's total profit is the result of "gain minus cost", so:

$$2 \cdot \frac{n}{5} - \frac{n}{3}.$$

To make a profit of 10 $, n has to satisfy the condition:

$$2 \cdot \frac{n}{5} - \frac{n}{3} = 10.$$

Solving the above equation, we obtain:

$$\frac{n}{15} = 10,$$
$$n = 150.$$

To make a profit of 10 $ Tim must sell 150 apples, that is, answer B.