There are 5044 brownies and cupcakes all together. The number of brownies is $448 more than the cupcakes. After 4/5 of the brownies and 1/4 of the cupcakes was sold, the number of brownies is two times of the cupcakes. Each brownie is 80 cents less than the cupcake. How much does each brownie cost?

Solution: We assume, that price of one brownie is x dollars. Then, price of one cupcake is $(x + 0.8)$ dollars. Let the initial number of brownies be y. Then, initial number of cupcakes is $(5044 - y)$.

If the initial number of brownies is $448 more than the cupcakes, it means that difference between total initial cost of y brownies and total cost of $(5044 - y)$ cupcakes is $448. The respective equation is:

$y \cdot x - (5044 - y) \cdot (x + 0.8) = 448$.

After 4/5 of the brownies was sold, there remains a 1/5 of the initial number of brownies, it is $y/5$.

After 1/4 of the cupcakes was sold, there remains a 3/4 of the initial number of cupcakes, it will be $(5044 - y) \cdot 3/4$. According to the condition of the task, the number of remained brownies is two times bigger than the number of remained cupcakes. We can write it as an equation:

$y/5 = 2 \cdot (5044 - y) \cdot 3/4$.

Thus, we obtained a system of 2 equations with 2 variables – x and y. After simplifying it will look as:

$$\begin{cases} 2x \cdot y - 5044x + 0.8y = 4483.2 \\ \frac{2}{15} y = 5044 - y \end{cases} \Rightarrow \begin{cases} 2x \cdot 4450.6 - 5044x + 0.8 \cdot 4450.6 = 4483.2 \\ y = 4450.6 \end{cases} \Rightarrow 3857.2x = 922.7$$

Then, x = 0.24 dollars = 24 cents.

Answer: 24 cents.