Quiz #14 Solution

When a sports agent negotiates a contract, he gets 4% of the value of the contract for up to $10,000,000. If a contract exceeds $10,000,000, the agent gets 6% of the remaining value. Write a piecewise-defined function $C$ that specifies the agents cut of a contract worth $x$ dollars.

The agent gets 4% of any contract worth $10,000,000$ or less

The agent gets 6% of the remaining value of any contract worth more than $10,000,000$

$10,000,000$

That means the intervals will be set-up as follows:

$$C(x) = \begin{cases} 
0.04x & \text{if } x \leq 10,000,000 \\
0.06(x - 10,000,000) & \text{if } x > 10,000,000 
\end{cases}$$

Now I need to determine the pieces of the function that go with each of those intervals. The first interval is $x \leq 10,000,000$, so if the agent negotiates any contract worth less than or equal to $10,000,000$, he gets 4% of that contact. So whatever the value of the contract is ($x$), as long as it’s less than $10,000,000$ ($x \leq 10,000,000$), the agent gets 4% ($0.04x$). So the first piece of the function is $0.04x$. 
\[ C(x) = \begin{cases} 
0.04x & \text{if } x \leq 10,000,000 \\
0.06x - 200,000 & \text{if } x > 10,000,000 
\end{cases} \]

The second interval is \( x > 10,000,000 \), so if the agent negotiates any contract worth more than $10,000,000, he gets 4\% of the first $10,000,000, and 6\% of the remaining value. To illustrate this, I will take the value of a contract in this interval \( x \) and break it into two parts; the first $10,000,000, and the remaining value.

\[
\text{Part 1} + \text{Part 2} = 0.04(10,000,000) + 0.06(x - 10,000,000)
\]

I use \( x - 10,000,000 \) to represent the remaining value of the contract because \( x \) is the total value of the contract, and the agent already been paid his commission on the first $10,000,000, so \( x - 10,000,000 \) would be the remaining value.

\[
0.04(10,000,000) + 0.06(x - 10,000,000) = 400,000 + 0.06x - 600,000
\]

\[ 0.06x - 200,000 \]

So the second piece of the function is \( 0.06x - 200,000 \).
a. The richest contract in sports history was signed by Lionel Messi in 2017 with FC Barcelona for 555,237,619€ (approximately $673,919,105). Assuming the agent above represented this athlete, how much would the agent make (in dollars) for negotiating that contract?

Since $673,919,105 is more than $10,000,000, it falls in the last interval of the piecewise function. Therefore, I will use the last piece of the function to determine how much the agent will make, and I will replace the $x$ in the expression $0.06x - 200,000$ with the value of the contract, 673,919,105:

$$0.06(673,919,105) - 200,000 = 40,235,146.30$$

So the agent would make approximately $40,235,146.30 for negotiating that contract.