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16. Paul is an interior house painter. He determines that the function $n = f(A)$ gives the number of gallons, n, of paint needed to cover an area, A, in square metres. Interpret $n = f(A) + 10$ and $n = f(A + 10)$ in this context.

n is the number of gallons of paint needed to cover a given area, A,

n = f(A)

n = f(A) + 10 is the number of gallons with an extra 10 more gallons.

This is represented as a vertical shift up b/c the amount of expected gallons was increased.

The parameter to the function f(...) designates an area.

Thus (A+10) must represents an area since it was given in the brackets of the function as areas are given.

Then the formula n = f(A + 10)

tells us what n is needed for an area A + 10, in other words:

n = f(A + 10) is the gallons needed for a change in area (i.e by 10 units) that is represented as horizontal shift. The shift is 10 units to the Left, when interpreted based on the formulas of function trasnsformations:

$$g(x) = f(x - h)$$

Therefore the mapping for the area, i.e. the horizontal parameter is:

$A \longrightarrow A-10$

because it happens to the Left.

This diminishes the area A to be less by 10 units of the original area

Therefore the meaning of $n = f(A + 10)$ is the number of gallons needed for an area that is **10 squared meters less than the original area.**