If having difficulties make sure you have read the hints in hint 1.2.

Hint: Percentage of something
3 percent of air pressure at sea level = .03 \( P \)
Using exponential equations \( P = P_0a^t \) or \( P = P_0e^{kt} \)
\( P_0 \) is the original amount then \( a^t \) or \( e^{kt} \) is the percentage of the original amount

#53 I like this question it makes you think. Asking the right question will help you figure out the process you must use to solve this problem. You can’t find a conclusion until you answer another question first.
There are two questions you could ask.
1. How old is the painting? Then decide if Vermeer could have painted it.
2. If a painting was painted by Vermeer how much carbon-14 would be present?
Answering either question 1 or 2 would at least answer the question if Vermeer could have painted it. Both these approaches would be correct, that is why it is important to inform your reader what you are looking for. It also helps keep you focused on what you are doing.

Method 1: How old is the painting?
How long (find \( t \)) does it take to have 99.5% of \( P_o \)?
You don’t need to know how much carbon a picture starts with. Let’s say it starts with \( P_o \) now it has 99.5% of \( P_o = .995 P_o \)
Method 2: If a painting were painted by Vermeer how much carbon-14 would be present?
What percentage of carbon-14 would be in a painting Vermeer painted if it was painted in the year he died? \((t = 200 - 1675)\) Place in today’s year
What percentage of carbon-14 would be in a painting Vermeer painted if it was painted in the year he was born? \((t = 200 - 1632)\)

See page two only if you really need more help or to verify your equation. Try to write the equation yourself. Verify equations on page 2
Problem 46
Using the first method:
This is the equation using the half-life formula solve for $t$. 

$$0.995 P_o = P_o \left( \frac{1}{2} \right)^{t/5730}$$

Using the second method

$$\frac{P}{P_o} = \left( \frac{1}{2} \right)^{t/5730}$$

This ratio is the percentage of carbon-14 that would be in a painting after $t$ years.