Find all numbers for which the rational expression, \( \frac{7 - 3x + x^2}{49 - x^2} \) is not defined.

As in the previous example (Exercise #6) we concentrate on finding which numbers or values of “x” that make the denominator in the rational expression “0.”
I.e., find what values (if any) of “x” that make 49 - x^2 zero?

Solve:  
\[
\begin{align*}
49 - x^2 &= 0 \\
7^2 - x^2 &= 0 \\
(7 + x)(7 - x) &= 0
\end{align*}
\]

the product on the left-side is zero when either factor is zero, 

hence either: \((7 + x) = 0 \quad \text{or} \quad (7 - x) = 0\)

\[
\begin{align*}
\downarrow & \quad \downarrow \\
\text{Subtract “7”} & \quad \text{Add “x”} \\
\downarrow & \quad \downarrow \\
x = -7 & \quad \text{or} \quad 7 = x
\end{align*}
\]

\[\therefore \quad x = \pm 7\]

are the numbers for which \( \frac{7 - 3x + x^2}{49 - x^2} \) is not defined

Note: neither the numerator nor denominator (in the original expression) is written in traditional form and it is tempting to take the time to rearrange them as...

\[
\frac{x^2 - 3x + 7}{-x^2 + 49}
\]

or even as \( \frac{-x^2 - 3x + 7}{x^2 - 49} \)

To do so would not change the outcome of the problem, since the values of “x” for which
\( x^2 - 49 = 0 \)

are exactly the same numbers as those which make
49 - x^2 = 0.

You should verify this for yourself, so as to justify why the effort to rewrite the original expression in the usual format is not a beneficial endeavor in this particular exercise.