3. [10 points] A group of students planted a pine tree and an oak tree alongside the Diag. Let $P(t)$ and $O(t)$ be the height (in feet) of the pine and the oak t years after they were planted, where

$$P(t) = 170 - 165A^{-0.02t} \quad \text{and} \quad O(t) = \frac{140}{2 + 100e^{-0.3t}}$$

where $A > 1$ is a constant. *For this problem, your answers should be in <u>exact form</u> or accurate up to the first two decimal places.*

a. [2 points] How tall (in feet) were each of the trees when they were planted?

Answer: Pine: _____   Oak: _____

b. [4 points] Ten years after the trees were planted, the height of the pine was 38 ft. Find the value of A. *Find your answer algebraically and show all your work.*

Answer: $A =$ _____

c. [4 points] How many years after being planted does it take the oak to be 38 ft? *Find your answer algebraically and show all your work.*

Answer: _____ years