Question 2:

A wedge as shown below is being used to lift the corner of the foundation of a house. How large must the pushing force be to exert a one ton (2000 lb) lifting force?

\[ \Sigma F_x = (0.15)(2000) + F_{N1} \sin(10) + 0.05F_{N1} \cos(10) \\
- F_{push} = 0 \]

\[ \Sigma F_y = F_{N1} \cos(10) - 0.05F_{N1} \sin(10) - 2000 = 0 \]
\[ F_{N_1} = \frac{2000}{\cos(\theta) - 0.05 \sin(\theta)} \]

\[ F_{N_1} = 2048.9 \text{ lbs} \]

\[ F_{\text{push}} = (15)(2000) + (2048.9) \sin(10) + (0.05)(2048.9) \cos(\theta) \]

\[ F_{\text{push}} = 756.7 \text{ lbs} \]