Setup the solutions (labeled sketch and equations) to the following problems. No points will be earned for numerical answers.

You wish to pull a fence post out of the ground using a home-made post-puller made out of 10-foot-long boards.

1. Where should the fulcrum be placed so that a 150 lb person can pull a post with a resistance of 1050 lb?

\[
\omega_1 = 150 \, \text{lb}
\]

\[
\omega_2 = 1050 \, \text{lb}
\]

\[
L_1 = L_2 \checkmark
\]

\[
L = 120^\circ \checkmark
\]

\[
\omega_1 L_1 = \omega_2 L_2 \checkmark
\]

\[
150 L_1 = 1050 L_2 \checkmark
\]

\[
L_1 + L_2 = 120^\circ \checkmark
\]
2. Assuming that you know the fulcrum location from the problem above, what is the maximum vertical distance the post will move for one "pull"? Assume the fulcrum is 12" high.

By similar triangles:
\[
\frac{h_p}{L_1} = \frac{h_p}{L_1 + L_2}
\]