\[ \Sigma F_y = 0 = -120 + N_A + N_B \]
\[ N_A + N_B = 120 \text{#} \]

\[ \Sigma F_x = 0 = P - F_A - F_B \]
\[ F_A + F_B = P \]
\[ 0.3N_A + 0.3N_B = P \]
\[ 0.3(N_A + N_B) = P \]
\[ 0.3(120) = 36 \text{#} = P \rightarrow \]

does it tip? \[ \Sigma M_B = 0 = -36(32) + 120(32) - 24N_A \]
and \[ N_A = 12 \text{#} \], so \[ N_A > 0 \] so it does not tip

\[ \text{b) casters locked @ B, free @ A, so } F_A > 0 \]
\[ F_B = 0.3 N_B \]
\[ \Sigma F_x = 0 \rightarrow P = F_B = 0.3 N_B \] (1)
\[ \Sigma M_A = 0 = -120(32) + 24N_B - 32P - \]
\[ 0 = -120(32) + 24N_B - 32(0.3N_B) \]
\[ N_B = 100 \text{#} \]

(1) \[ F_B = 0.3(100) = 30 \text{#} \]
\[ \Sigma F_y = 0 = P - 30 \rightarrow P = 30 \text{#} \]
with \[ P = 30 < 36 \text{ as above, does not tip} \]

\[ \text{c) casters locked @ A, free @ B, so } F_B = 0 \]
\[ F_A = 0.3 N_A \]
\[ \Sigma F_x = 0 \rightarrow P = F_A = 0.3 N_A \] (2)
\[ \Sigma M_B = 0 = -24N_A - 32P + 120(12) \]
\[ = -24(12) - 32(0.3N_A) + 120(12) \]
\[ N_A = 42.86 \text{#} \]
(2) \[ F_A = 0.3 N_A = 12.86 \text{#} \]
\[ \Sigma F_x = 0 = P - 12.86 \rightarrow P = 12.86 \text{#} \]
and it does not tip
(a) See Eq. 8.19 and \( P = 36 \) ft

(b) \[ \Sigma M_B = 0 = 120(12) - 36 \times h \]
\[ h = 40'' \]

Infinite small weight

No reaction when tipping impending
NOTE - 3 FORCE MEMBER

SO R_B must pass through C

Components of R_B are
NB & FB

θ is φ_S

\[
\tan \theta = \tan \phi_S = \frac{1.25}{6} = 0.208
\]

and \[\tan \phi_S = m_S = 0.208\]