3-3 A homogeneous cylinder weighing 500 lb rests against two smooth planes that form a trough as shown in Fig. F3-3. Determine the forces exerted on the cylinder by the planes at contact points A and B.

SOLUTION

From a free-body diagram for the cylinder:

\[ + \uparrow \Sigma F_y = F_B \cos 30^\circ - W \]
\[ = F_B \cos 30^\circ - 500 = 0 \]
\[ F_B = 577.35 \text{ lb} \approx 577 \text{ lb} \]
\[ F_B = 577 \text{ lb} \hat{y} \] Ans.

\[ + \rightarrow \Sigma F_x = F_A - F_B \sin 30^\circ \]
\[ = F_A - 577.35 \sin 30^\circ = 0 \]
\[ F_A = 288.68 \text{ lb} \approx 289 \text{ lb} \]
\[ F_A = 289 \text{ lb} \] Ans.
3-11 Determine the forces in cables A and B if block W of Fig. P3-11 weighs 350 lb.

![Fig. P3-11](image)

**SOLUTION**

From a free-body diagram for the block W:

\[ \sum F_y = F_C - W \]
\[ = F_C - 350 = 0 \]

\[ F_C = 350 \text{ lb} \]

\[ F_C = 350 \text{ lb} \] (on the ring)

From a free-body diagram for the ring:

\[ \sum F_x = F_B \cos 30^\circ - F_A \cos 45^\circ = 0 \]

\[ F_B = 0.8665 \times F_A \]

\[ \sum F_y = F_B \sin 30^\circ + F_A \sin 45^\circ - 350 \]
\[ = 0.8665 F_A \sin 30^\circ + F_A \sin 45^\circ - 350 = 0 \]

\[ F_A = 313.80 \text{ lb} \]

\[ F_A = 314 \text{ lb} \] (Ans.)

\[ F_B = 0.8665 \times F_A = 0.8665(313.80) = 266.22 \text{ lb} \]

\[ F_B = 256 \text{ lb} \] (Ans.)