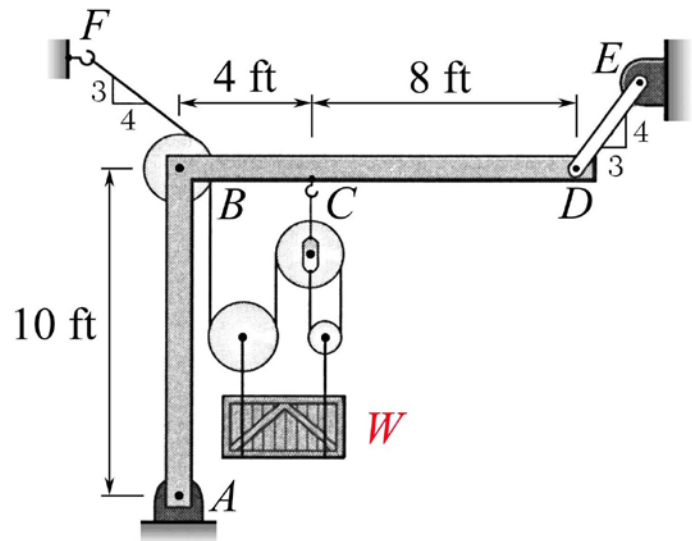A crate of weight W is supported as shown. If the tension in the cable attached to the hook at F is $F_1 = 135$ lb, determine *(a)* the value of W, *(b)* the tension F_2 in the cable attached to the hook at C, *(c)* the force **B** exerted by the pin on the pulley at B, *(d)* the force **B'** exerted by the pulley on the pin at B, *(e)* the tension F_{DE} in the link DE, *(f)* the reaction force **A** at the support A.

FBD for the crate and the two pulleys directly above it ①
$$W = 540 \text{ lb} \quad ①$$

FBD for the pulley directly below C ①
$$F_2 = 405 \text{ lb} \quad ①$$

FBD for the pulley at B ①

Exerted by pin on pulley at B: $\mathbf{B} = 108\mathbf{i} + 54\mathbf{j}$ lb ①

FBD for the frame $ABCD$ ①

Exerted by pulley on pin at B: $\mathbf{B'} = -108\mathbf{i} - 54\mathbf{j}$ lb ①

$F_{DE} = 150$ lb ① $\mathbf{A} = 18\mathbf{i} + 339\mathbf{j}$ lb ①