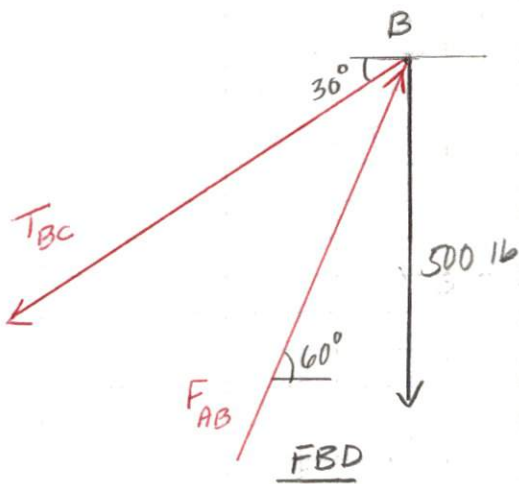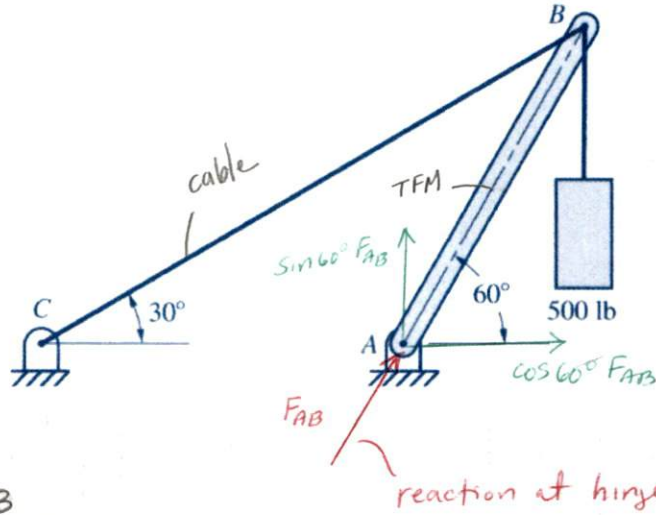3-20

Refer to Fig. P3-20. Determine the reaction at the hinge support at A due to a 500-lb load on the derrick.

Solution.
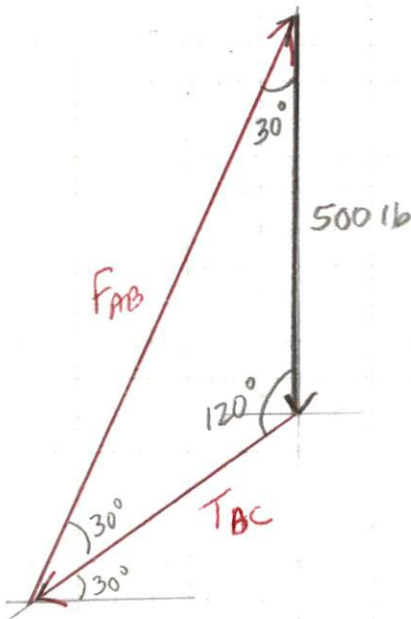

cable
TFM
$\sin 60° F_{AB}$
C
$30°$
$60°$
500 lb
A
$\cos 60° F_{AB}$
F_{AB}
reaction at hinge support A
B

B
$30°$
T_{BC}
$500\ lb$
$60°$
F_{AB}
FBD

Law of Sines

$$\frac{F_{AB}}{\sin 120°} = \frac{500\ lb}{\sin 30°}$$

$$F_{AB} = \frac{\sin 120°\ (500\ lb)}{\sin 30°} = 866\ lb$$

Reaction at Hinge Support A

$$F_{AB} = 866\ lb\ \angle\ 60°$$

$30°$
$500\ lb$
F_{AB}
$120°$
$30°$
T_{BC}
$30°$

Force- Triangle