**7.83**

**GIVEN:**
Structure and loading shown

**(a)** Draw V and M diagrams for BTAIIL HB.

**(b)** Determine magnitude and location of $M_{max}$.

**Reactions at Supports**
Because of symmetry of load,
$A = B = \frac{1}{2} (300 \times 8 + 300)$
$A = B = 1350 \text{ lb}$

**Load Diagram for AB**
The 300-lb force at D is replaced by an equivalent force-couple system at C.

**Shear Diagram**
At A: $V_A = A = 1350 \text{ lb}$

To determine point E where $V = 0$:

$V_E - V_A = -450$
$0 - 1350 \text{ lb} = (300 \times 45) x$
$x = 4.50 \text{ ft}$

We compute all areas

**B.M. Diagram**
At A: $M_A = 0$
Note 600-lb-ft drop at C due to couple
$M_{max} = 3040 \text{ lb-ft}$, 4.50 ft from A.