108. Because required shear/moments are at face of elements, simplified shear-moment diagrams can be used.

$V_1 = 0 - 10 = -10$ kips

$V_2 = -10 + 12.8 - 1.5 = 1.3$ kips

$V_{ab} = 1.3$ kips

$V_3 = 1.3 - 1.0 = 0.3$ kip

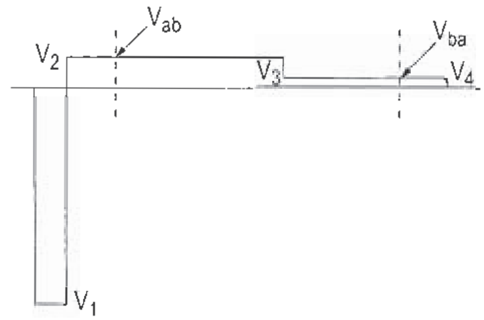
$V_{ba} = 0.3$ kip

$V_4 = 0.3 - 17 - 2 + 18.7 = 0.0$ kip

Calculate moments from shear diagram:

$M_{ab} = (1.3 \text{ kips})(2 \text{ ft})(-10 \text{ kips})(1.5 \text{ ft}) = -12.4$ ft-kips

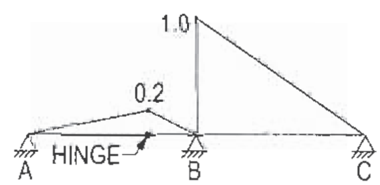
$M_{ba} = 0 - (0.3 \text{ kip})(2 \text{ ft}) = -0.6$ ft-kip



SHEAR DIAGRAM

THE CORRECT ANSWER IS: (D)

109. Influence line for shear at right side of B:



V_{B_R} from uniform load = area under influence line × w

V_{B_R} from point load = maximum value of influence line × P

$V_{B_R} = (1/2)(0.2)(60 \text{ ft})(1.0 \text{ klf}) + (1/2)(1.0)(60 \text{ ft})(1.0 \text{ klf}) + (1.0)(10 \text{ kips})$

$= 46.0$ kips

THE CORRECT ANSWER IS: (D)

110. Distribution factor $= \dfrac{K}{\sum K \text{ of joint}}$

$K = \dfrac{EI}{L}$ where E is constant

$K_{AB} = \dfrac{200}{20} = 10$

$K_{BC} = \dfrac{300}{15} = 20$

$DF_{B-A} = \dfrac{10}{10 + 20} = 0.33$

$DF_{B-C} = \dfrac{20}{10 + 20} = 0.67$

THE CORRECT ANSWER IS: (A)