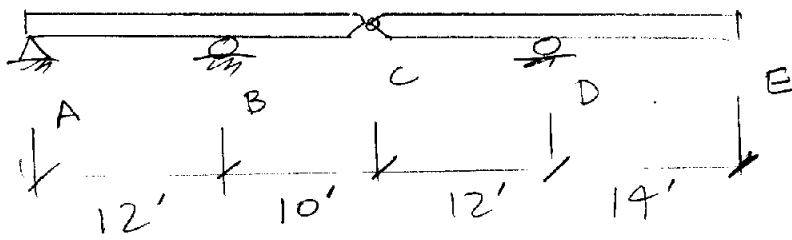


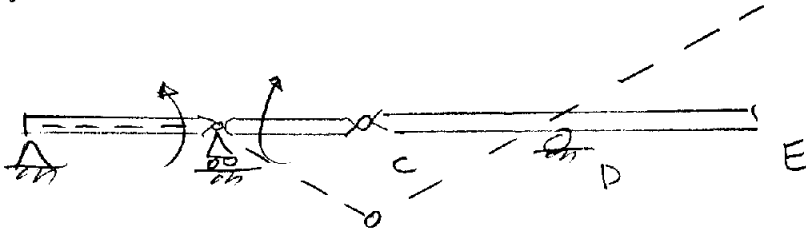
2)

CE 160 MIDTERM
QUIZ 2

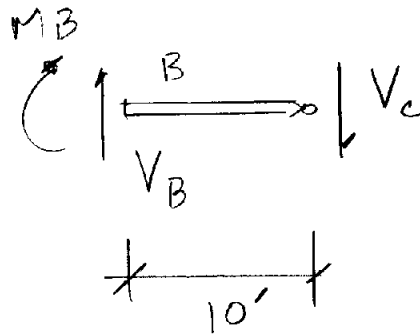
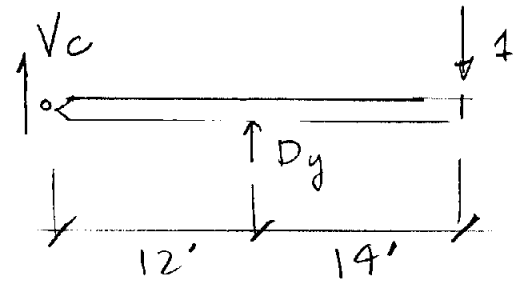
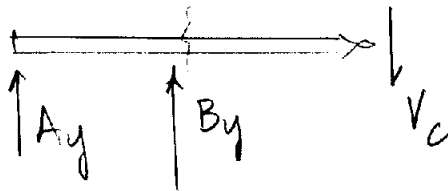
FALL 2020



MB IDEALIZATION



UNIT LOAD AT E



$$\sum M_D = 0$$

$$-V_c(12') - 1(14') = 0$$

$$V_c = 14/12 = 7/6$$

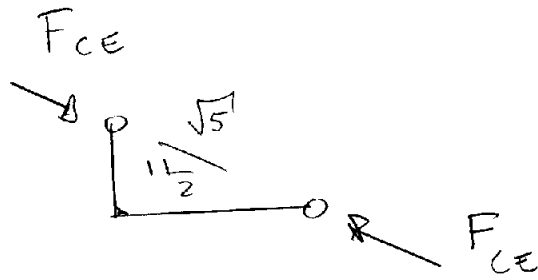
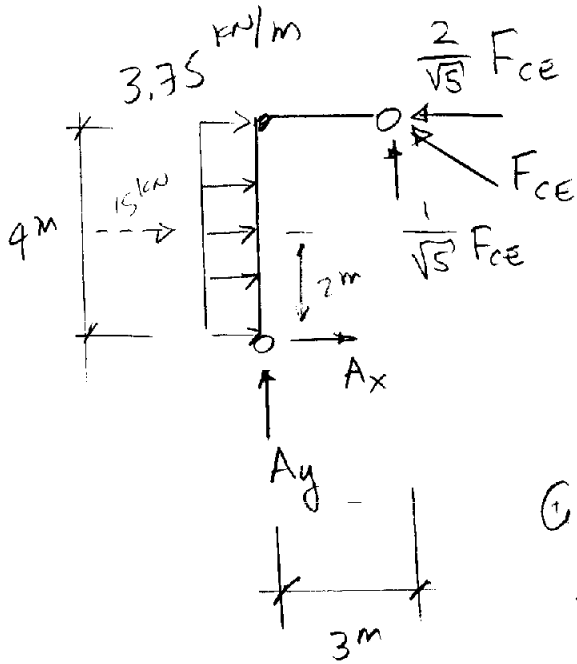
$$V_c = -1.17$$

$$\sum M_B = 0$$

$$-M_B - V_c(10') = 0$$

$$M_B = -10V_c = -10(-1.17) = \underline{\underline{11.67 \text{ FT}}}$$

1)



$$\circlearrowleft \sum M_A = 0$$

$$-15(2) + \frac{1}{\sqrt{5}} F_{CE} (3) + \frac{2}{\sqrt{5}} F_{CE} (4) = 0$$

$$-30 + \frac{11}{\sqrt{5}} F_{CE} = 0$$

$$F_{CE} = 30 \left(\frac{\sqrt{5}}{11} \right) = \underline{6.098 \text{ kN}}$$

$$+\uparrow \sum F_y = 0$$

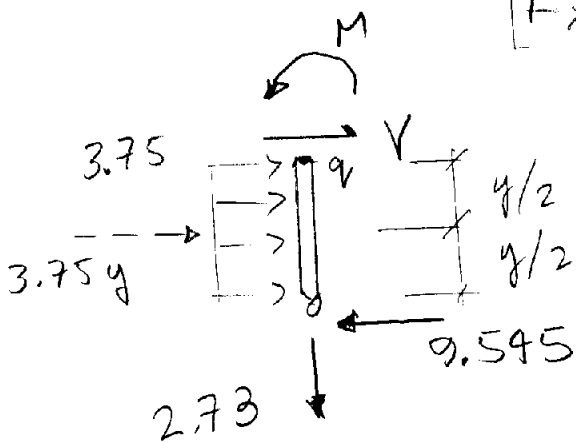
$$A_y + \frac{1}{\sqrt{5}} \left(\frac{30\sqrt{5}}{11} \right) = 0 \quad \boxed{A_y = -2.73 \text{ kN}}$$

$$+\rightarrow \sum F_x = 0$$

$$A_x + 15 - \frac{2}{\sqrt{5}} \left(\frac{30\sqrt{5}}{11} \right) = 0$$

$$\boxed{A_x = -9.545 \text{ kN}}$$

$$\boxed{|A_x| = 9.545 \text{ kN}}$$



$$\sum F_x = 0$$

$$V + 3.75y - 9.545 = 0$$

$$\therefore \boxed{V = -3.75y + 9.545}$$

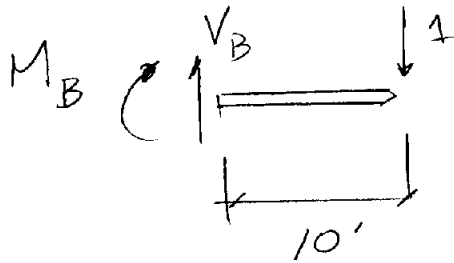
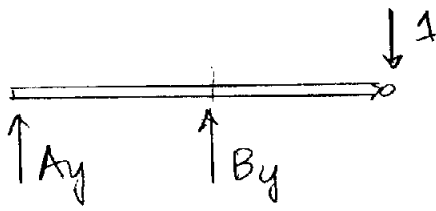
$$\circlearrowleft \sum M_y = 0$$

$$M + 3.75y \left(\frac{y}{2} \right) - 9.545y = 0$$

$$\therefore \boxed{M = -1.875y^2 + 9.545y}$$

UNIT LOAD AT C

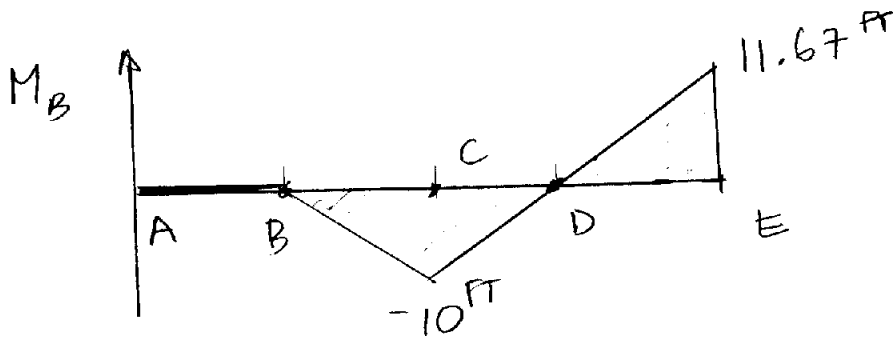
CE 160 MIDTERM
QUIZ 2
FALL 2020



$$\circlearrowleft \sum M_B = 0$$

$$-M_B - 1(10') = 0$$

$$M_B = -10' \text{ FT}$$



LIVE LOAD OF 1.6 K/FT

$$M_{B_{MAX}}^+ = 1.6 \text{ K/FT} \left(\frac{1}{2}\right)(14') (11.67') \\ = \underline{\underline{130.7 \text{ K-FT}}}$$

$$M_{B_{MAX}}^- = 1.6 \text{ K/FT} \left(\frac{1}{2}\right)(22') (-10') \\ = \underline{\underline{-176.0 \text{ K-FT}}}$$