

Name

Jamaal giaz

ID

7832

Subject

Structure (1)

To

Engr Saadib shah

Exam

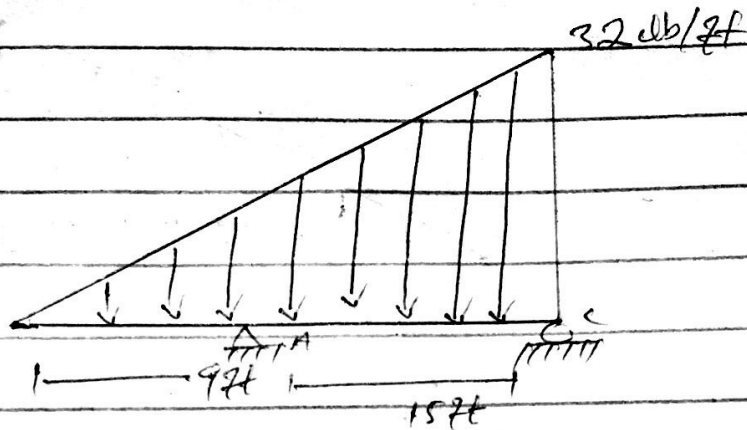
Final Term

Date

26/9/2020.

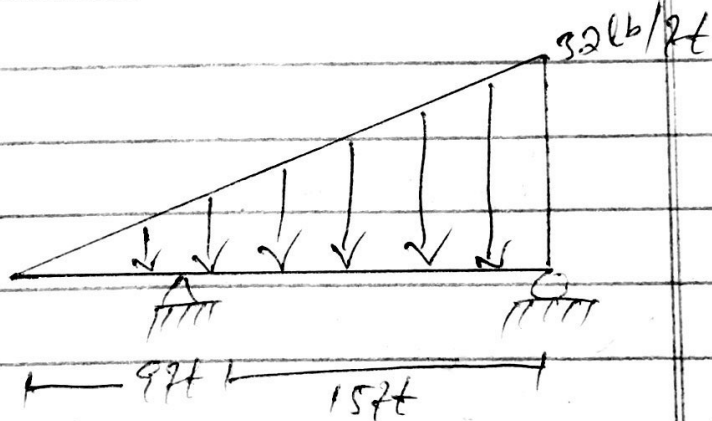
EID = 7832

Q # 01
Sol

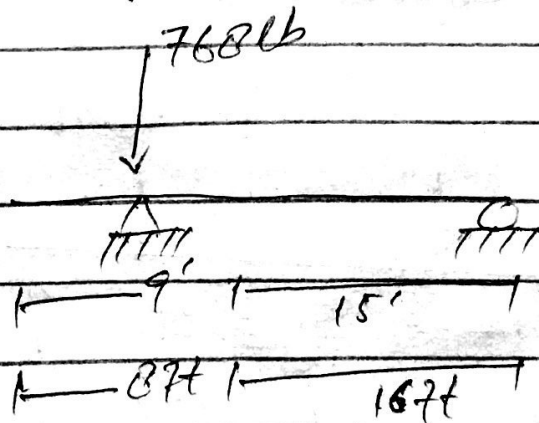


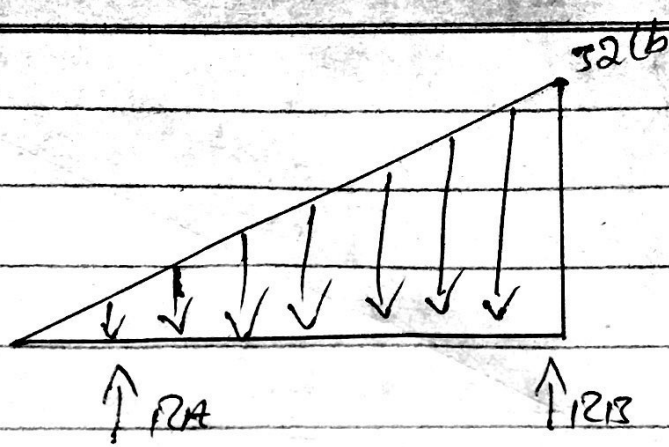
Sol

To find the shear force & bending moment diagram.
(F.B.D)

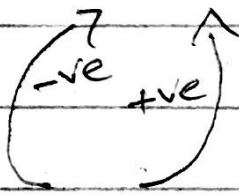


To find at the ~~load~~ point load at uniform varying load.





To find out the support reaction



$$\sum M_B = 0$$

$$-15R_A + 768(16) = 0$$

$$R_A = \frac{768(16)}{15}$$

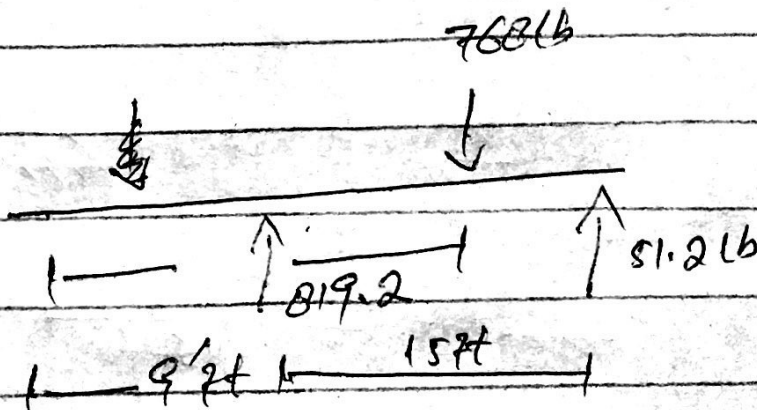
$$R_A = 819.2 \text{ lb}$$

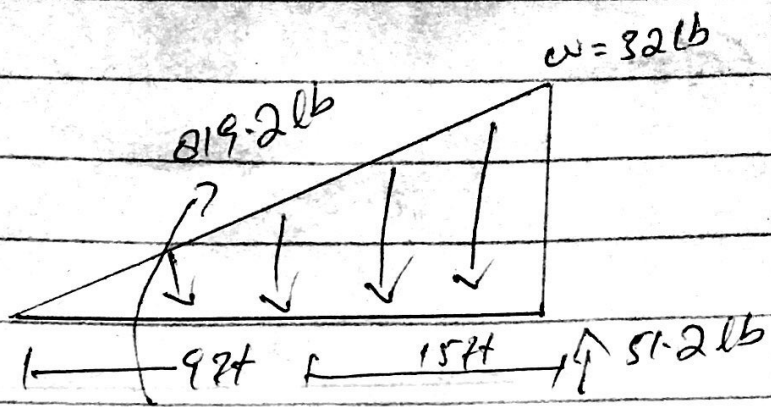
$$-\downarrow + \uparrow + \sum F_y = 0$$

$$-768 + R_A + R_B = 0$$

$$-768 + 819.2 + R_B = 0$$

$$R_B = +51.2 \text{ lb}$$





Now to find applicable load is be

$$\frac{w_0 l}{4} - \frac{1}{2} \left(\frac{w_0 x}{l} \right) (x) = 0$$

$$192 - \frac{1}{2} \left(\frac{32x}{l} \right)$$

$$\frac{16x^2}{l} - 192$$

$$\frac{16x^2}{l} - 192 = 0$$

$$0.66x^2 - 192 = 0$$

$$0.66x^2 - 192 = 0$$

$$0.66x^2 = 192$$

$$\frac{0.66}{0.66} = \frac{192}{0.66}$$

$$\sqrt{0.66} = \sqrt{290.90}$$

$$x = 17.055$$

(-ve) (+ve)

$$m + \frac{1}{2} \left(\frac{w_0 x}{l} \right) x \left(\frac{x}{3} \right) - \frac{w_0 l}{4} \left(\frac{x-l}{3} \right) = 0$$

$$m = -\frac{1}{2} \left(\frac{32(17.055)(17.055) \left(\frac{17.055}{3} \right) + \frac{32 \times 24}{4}}{24(17.055 - 24/3)} \right) = 0$$

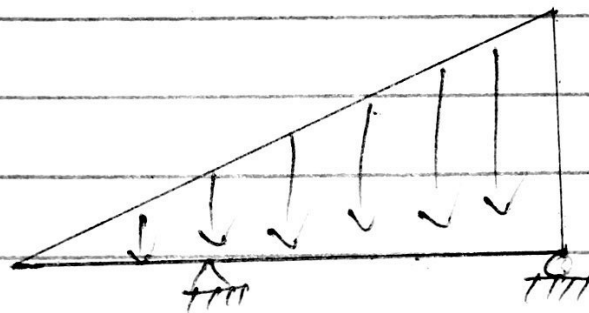
$$m = -2267.7 + 1738.56$$

$$m = -529.14 \text{ lb/ft}$$

The negative sign shows that

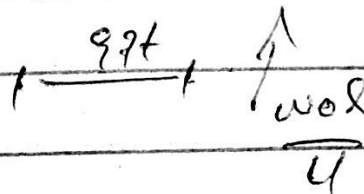
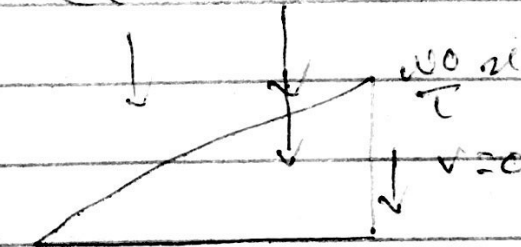
The moment reaction is in clockwise direction.

Now a section



$$\leftarrow 9 \text{ ft} \qquad \qquad \qquad 15 \text{ ft} \qquad \rightarrow$$

$$\frac{1}{2} \left(\frac{100}{1} \times 9 \right) (9)$$



$$\frac{1}{2} \left(\frac{(100)(17.055)}{24} \right) (17.055)$$

$$= 7193.91 \text{ lb}$$

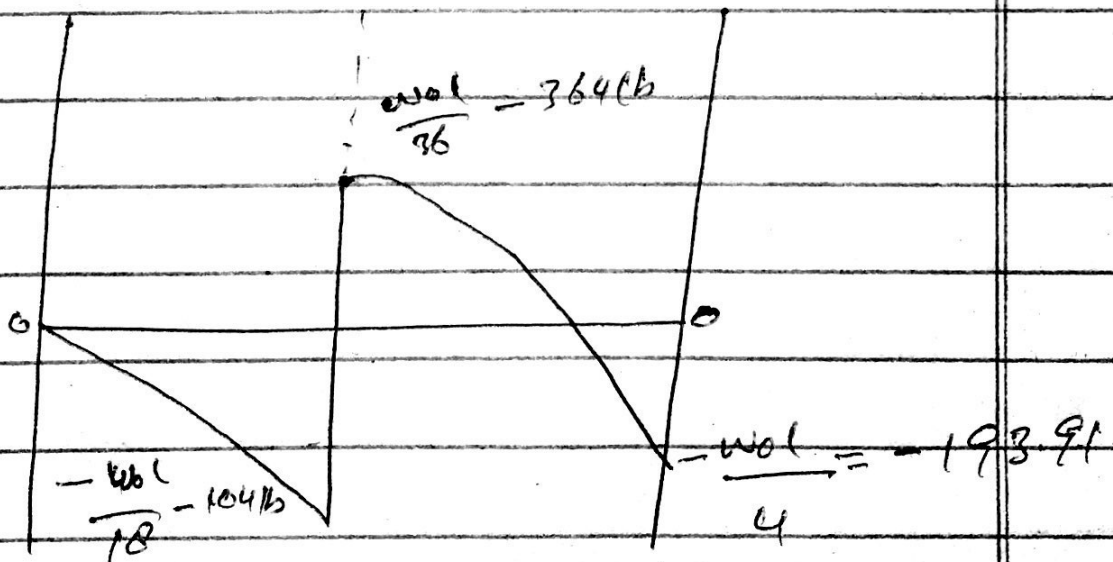
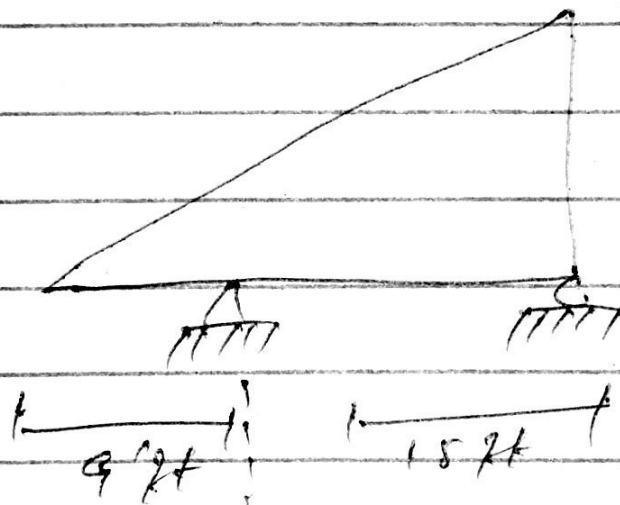
$$\frac{w_0 x}{d} \Rightarrow \frac{32}{24} (17.055)$$

$$\Rightarrow 22.74 \text{ lb/ft}$$

$$\frac{1}{2} \left(\frac{32(17.055)}{24} (17.055) \right)$$

$$= 193.91 \text{ lb}$$

Now shear force & Bending moment diagram.

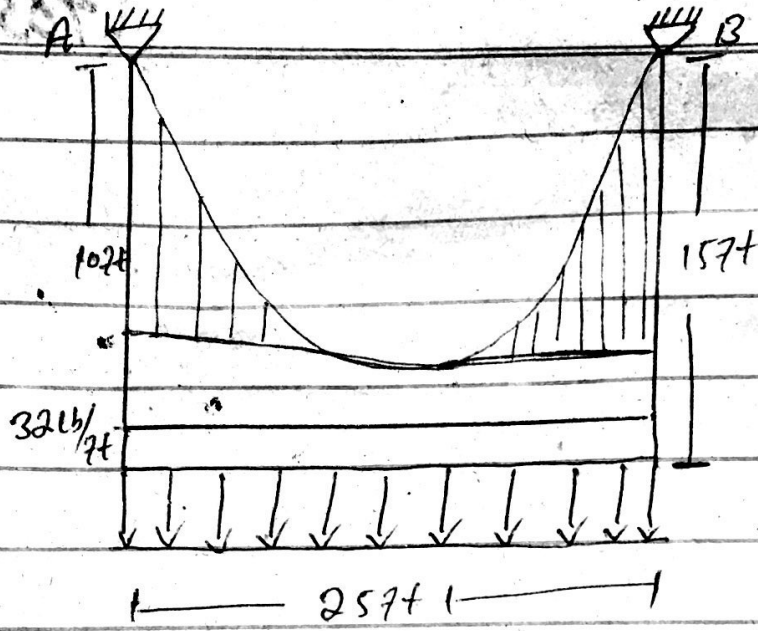


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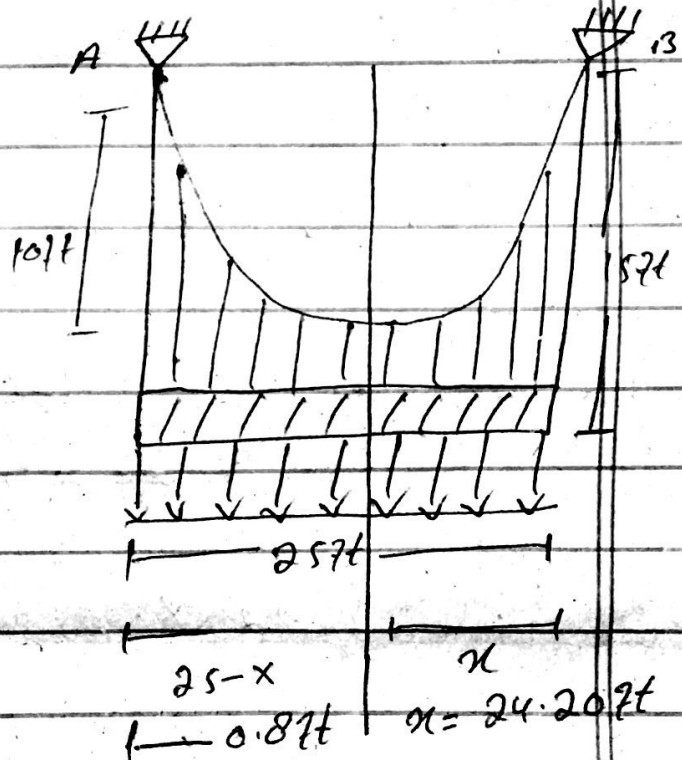
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Q

02



Sol:



$$FH = \frac{wl^2}{2h}$$

$$FH = \frac{32(25-x)^2}{2 \times 10}$$

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$$FH = 32 \cdot (x^2)$$

$$\Rightarrow \frac{32(25 \cdot x)^2}{2 \times 10} = \frac{16(x)^2}{2 \times 15}$$

$$\sqrt{(25x)^2} = \sqrt{x^2(16/15)}$$

$$25x = x(1.0327)$$

$$x = \frac{25}{1.0327}$$

$$x = 24.20$$

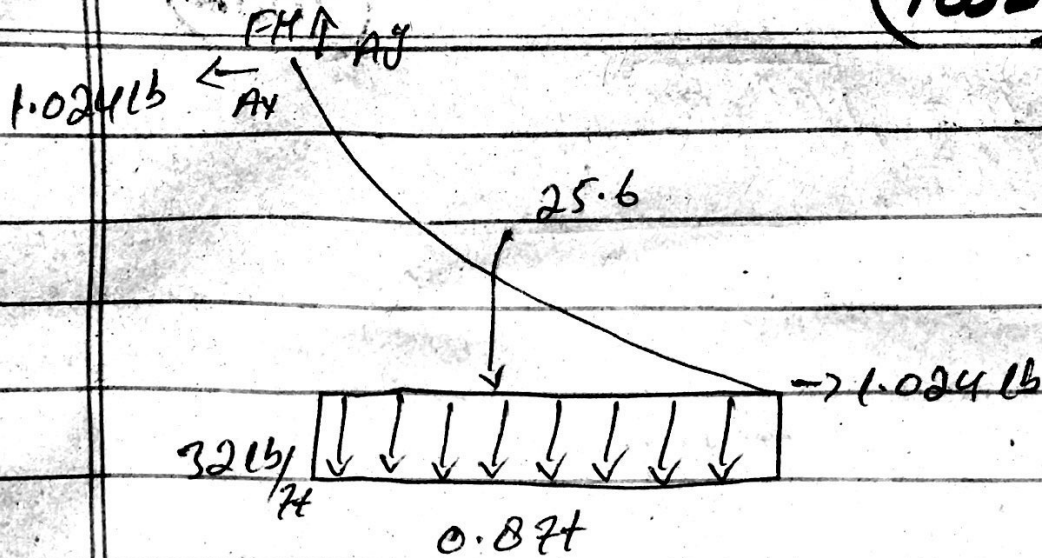
$$25 - x \Rightarrow 24$$

$$25 - 24.20 = 0.8$$

$$FH = \frac{32 \times (0.8)^2}{2 \times 10}$$

$$FH = AX - BX = 1.024 \text{ db}$$

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$$\sum F_y = 0$$

$$A_y = 25.6 \text{ lb}$$

$$T_A = \sqrt{A_x^2 + A_y^2}$$

$$T_A = \sqrt{(1.024)^2 + (25.6)^2}$$

$$T_A = 25.62 \text{ lb}$$

$$\sum F_y = 0$$

$$B_y + 25.6 - 25 \times 32 = 0$$

$$B_y = 774.4$$

$$B_y = 774.4 \text{ lb}$$

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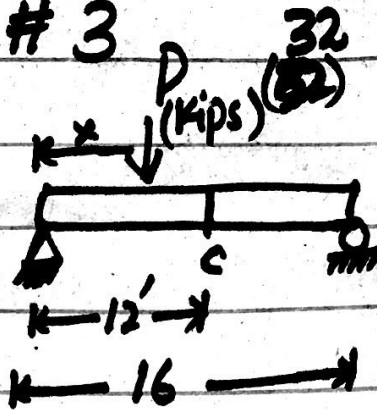
$$T_B = \sqrt{B^2 + B_y^2}$$

$$T_B = \sqrt{(1.024)^2 + (774.4)^2}$$

$$T_B = 774.400 \text{ lb}$$

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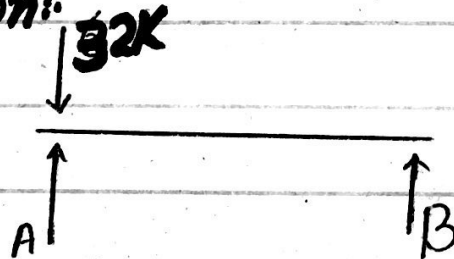
Q. NO # 3



Influence Line for R_A ..

For $x=0$ $R_A=?$

Solution:



$$\sum M_B = 0$$

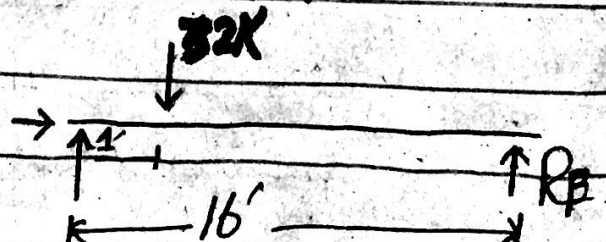
$$(32 \times 16) - R_A(16) = 0$$

$$\frac{512}{16} = 32$$

$$R_A = 32$$

For $x=14'$..

$R_A=?$



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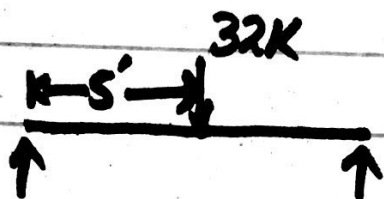
$$\sum M_B = 0$$

$$(32 \times 15) - R_A(16) = 0$$

$$R_A = \frac{480}{16}$$

$$R_A = 30$$

for $x=5$ $R_A=?$



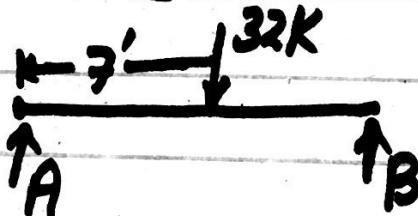
$$\sum M_B$$

$$(32 \times 5) - R_A(16) = 0$$

$$160 - R_A(16) = 0$$

$$R_A = 10K$$

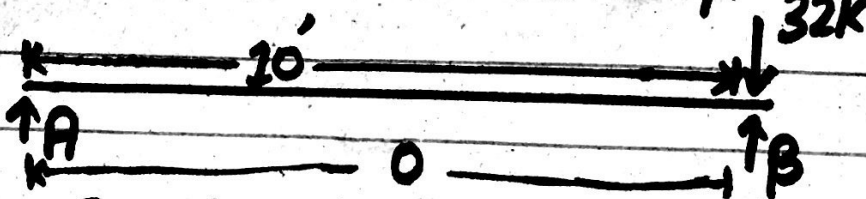
But $x=7$ $R_A=?$



$$\sum M_B$$

$$(32 \times 7) - R_A(16) = 0$$

$$R_A = 14K$$



$$-R_A(16) + 62(0) = 0$$

$$R_A = 0$$

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