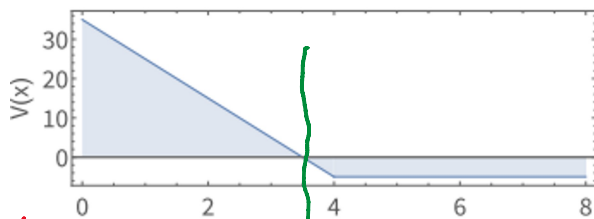
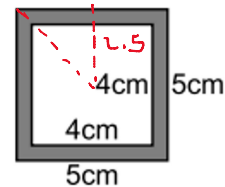
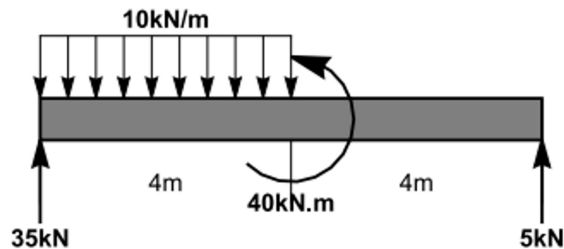


## Quiz 7

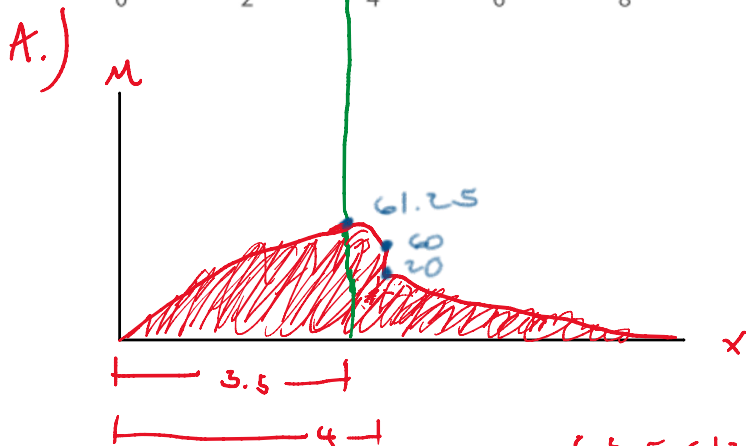
Thursday, November 19, 2020 4:44 PM

1. The beam is loaded as shown. The beam has a hollow cross section as shown ( $I = 0.31 \times 10^6 \text{ mm}^4$ ).
  - a. Draw the bending moment diagram with the given free body diagram and shear force diagram
  - b. Determine the maximum bending moment,  $M_{max}$ , in the beam
  - c. Determine the maximum flexural stress,  $\sigma_{max}$ , and its location ( $x, y$ )



$$\frac{6(1.5)}{2} = 1.5$$

$$\frac{35(3.5)}{2} = 61.25$$



$$(3.5, 61.25)$$

$$(4, 60)$$

$$(4, 20)$$

B.)

$$M_{max} = 61.25 \text{ kN}\cdot\text{m}$$

C.)

$$\sigma_{max} = \frac{Mc}{I}$$

$$c = 25\sqrt{2} \text{ mm}$$

c.)

$$\sigma_{max} = \frac{MC}{I}$$

$$C = 25\sqrt{2} \text{ mm}$$

$$I = .31 \times 10^6$$

$$\sigma_{max} = \frac{-61.25 \times 10^3 (25\sqrt{2})}{.31 \times 10^6}$$

$$\sigma_{max} = -6.985 \text{ uN/mm}^2$$

$$\text{at } x = 4 \text{ ft}$$