

## ENDS 231: Practice Quiz 8

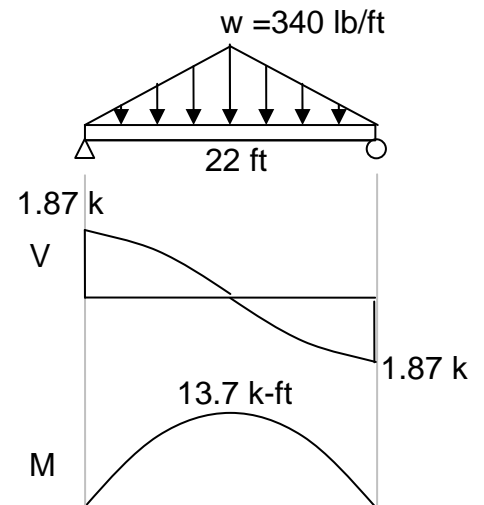
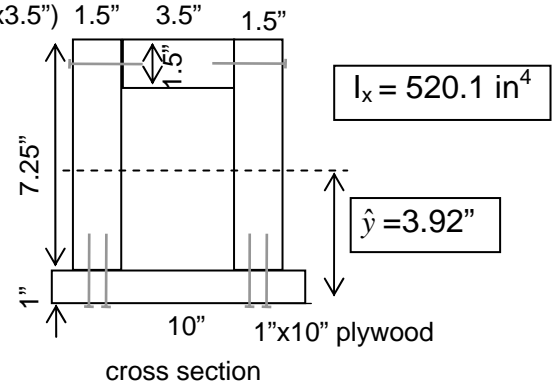
Clearly show your work and answer.

A lintel beam 22 ft long is used in carrying the imposed loads. It is a built up section 8.25" deep of 2 x 8 sides with a 2 x 4 top (2 nails) and a 1 x 9 plywood bottom (4 nails) as shown. The centroid and moment of inertia for bending about the x axis is given in the figure.

Find:

- the maximum bending stress for the section,  $f_b$
- the required shear capacity of the nails for the \_\_\_\_\_ (top or bottom connected piece) if the pitch spacing is 5.5 inches
- the maximum deflection in the beam knowing  $E = 1.4 \times 10^6$  psi
- [some short question from the text material]

2-2x8 (1.5"x7.25")  
with 2x4 (1.5"x3.5")



Answers:

- $f_b = 1369$  psi
- $F \geq 186$  lb ( $Q_{\text{top}} = 18.8$  in) or  $169$  lb ( $Q_{\text{bottom}} = 34.2$  in)
- $\Delta_{\text{max}} = 1.58$  in

**Disclaimer: Answers have NOT been painstakingly researched.**