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ENGR 213-001 Sp17 / HW CH 10

*P10.050 GO Multipart

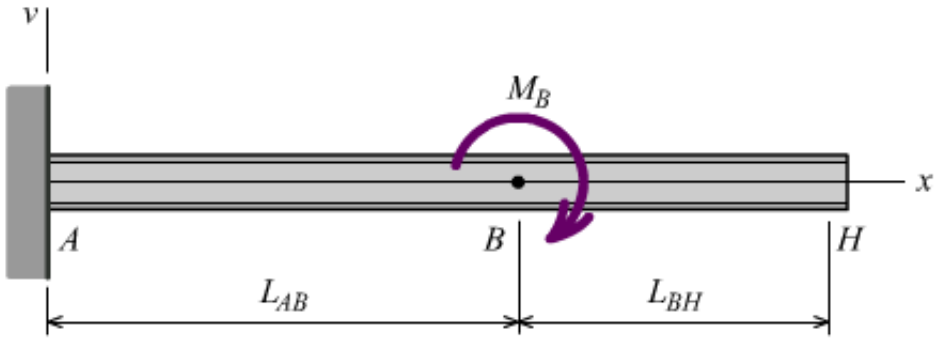
*Part 1

☑ Correct

You will analyze four different beams. For each beam and loading, determine the beam deflection at point *H*. Assume that $EI = 1.0 \times 10^7$ kip-in.^{2} is constant for each beam. Remember that a positive deflection is up and a positive rotation is counterclockwise.

Here is Beam 1.

Assume L_{AB}=7 ft, L_{BH}=8 ft, M_B=45 kip-ft.



For Beam 1, determine the deflection and rotation angle at point *B*.

Answers: v_{B1} = -0.191 in., θ_{B1} = -0.004536 rad.

Answer *1: *the tolerance is +/-2%*
Answer *2: *the tolerance is +/-2%*

Attempts: Unlimited

*Part 2

☑ Correct

For Beam 1, determine the deflection at point *H*.

Answer: v_{H1} = -0.627 in.

the tolerance is +/-2%

Attempts: Unlimited

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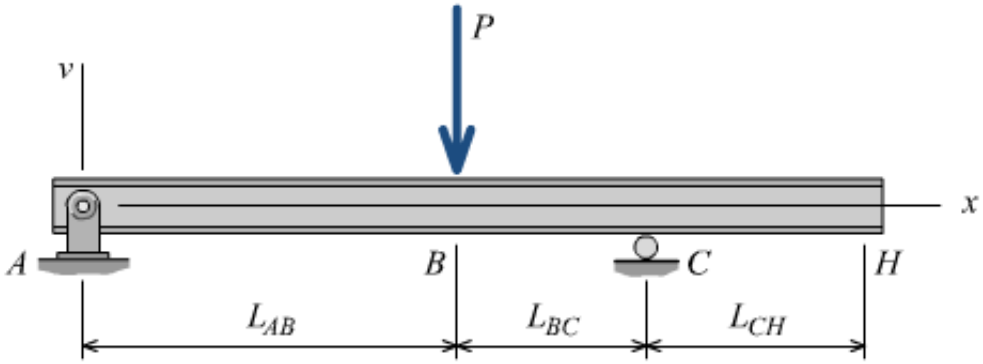
*Part 3

☑ Correct

Here is Beam 2

Assume L_{AB}=14 ft, L_{BC}=8 ft, L_{CH}=4 ft, P=15 kips.



For Beam 2, determine the rotation angle at point *C*.

Answer: θ_{C2} = 0.00659 rad.

the tolerance is +/-2%

Attempts: Unlimited

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*Part 4

☑ Correct

For Beam 2, determine the deflection at point *H*.

Answer: v_{H2} = 0.316 in.

the tolerance is +/-2%

Attempts: Unlimited

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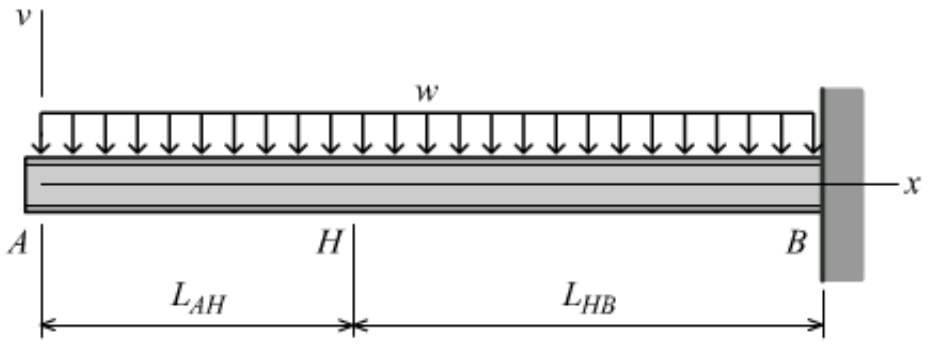
*Part 5

Correct

Here is Beam 3.

Assume L_{AH}=4 ft, L_{HB}=8 ft, w=2.5 kips/ft.



For Beam 3, determine the deflection at point H.

Answer: v_{H3} = -0.6266 in.

the tolerance is +/-2%

Attempts: Unlimited

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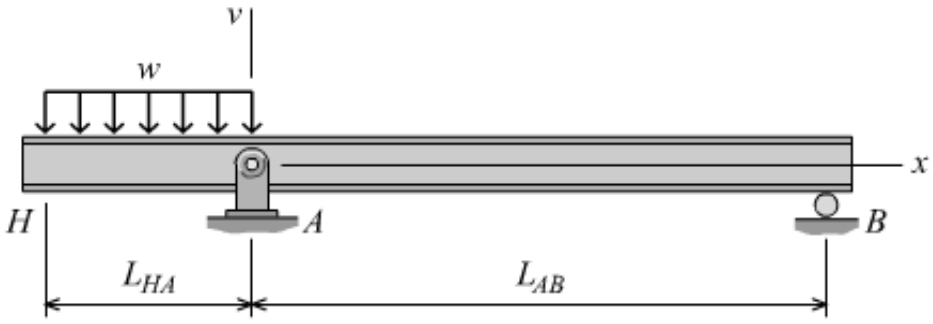
*Part 6

Correct

Here is Beam 4.

Assume L_{HA}=6 ft, L_{AB}=18 ft, w=3.0 kips/ft.



For Beam 4, determine the cantilever deflection of the beam at point H due to the uniformly distributed load 3.0 kips/ft between point A and point H. This is the deflection that would be calculated at point H assuming a fixed support at A.

Answer: v_{H4a} = -0.084 in.

the tolerance is +/-2%

Attempts: Unlimited

*Part 7

Correct

For Beam 4, determine the magnitude (report a positive number) of the bending moment at point *A* due to the uniformly distributed load 3.0 kips/ft between point *H* and point *A*.

Answer: M_A = 54 kip-ft.

the tolerance is +/-2%

Attempts: Unlimited

*Part 8

Correct

For Beam 4, determine the rotation angle at point *A* due to the moment produced at *A* by the uniformly distributed load 3.0 kips/ft between point *H* and point *A*.

Answer: θ_{A4} = 0.00466 rad.

the tolerance is +/-2%

Attempts: Unlimited

*Part 9

Incorrect

The component of the deflection at *H* due to the rotation angle at point *A* equals the rotation angle times the distance from point *A* to point *H*. Be careful with units and the sign convention. A downward deflection is negative, and an upward deflection is positive.

For Beam 4, determine the component of the deflection at point *H* due to the rotation angle at *A*.

Answer: v_{H4b} = 0 *1 in.

the tolerance is +/-2%

Attempts: Unlimited

*Part 10

☑ Correct

For Beam 4, determine the total deflection at point *H*.

Answer: v_{H4} = -0.419 in.

the tolerance is +/-2%

Attempts: Unlimited

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