1) You are given a stress-strain curve (and the blow-up). You need to determine if a bar with a cross-sectional area A_0 can support a load F in pure tension without showing permanent deformation.

a) Describe what steps you would take.

b) Put the steps in order.

2) You are given a stress-strain curve (and the blow-up). The bar must support a load F in pure tension without showing permanent deformation. Determine the required with a cross-sectional area A_0

a) Describe what steps you would take.

b) Put the steps in order.

3) You are given a stress-strain curve (and the blow-up). A bar with a cross-sectional area A_0 must support a load F in pure tension without showing permanent deformation. Determine F.

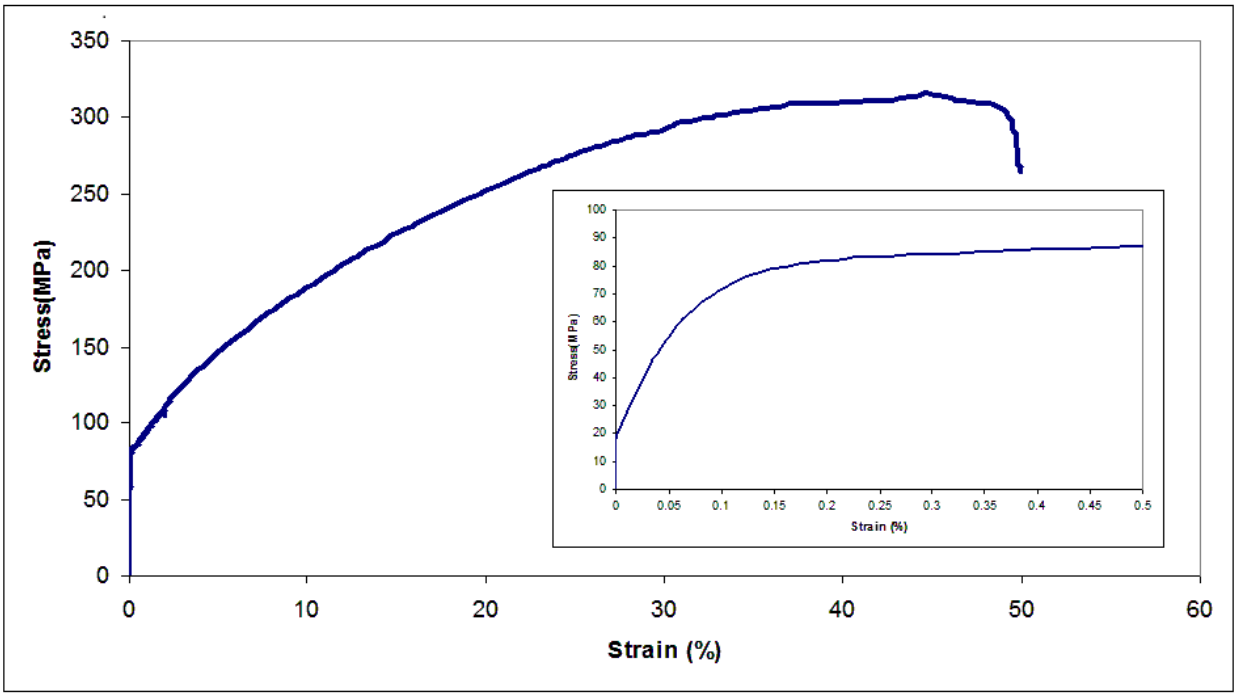
a) Describe what steps you would take.

b) Put the steps in order.

4) You are given a stress-strain curve (and the blow-up). A bar (length = L_0) is subjected to a stress between greater than the yield strength but less than the ultimate tensile strength. You need to determine if the length under load (L_F) will exceed a critical value (L_C).

a) Describe what steps you would take.

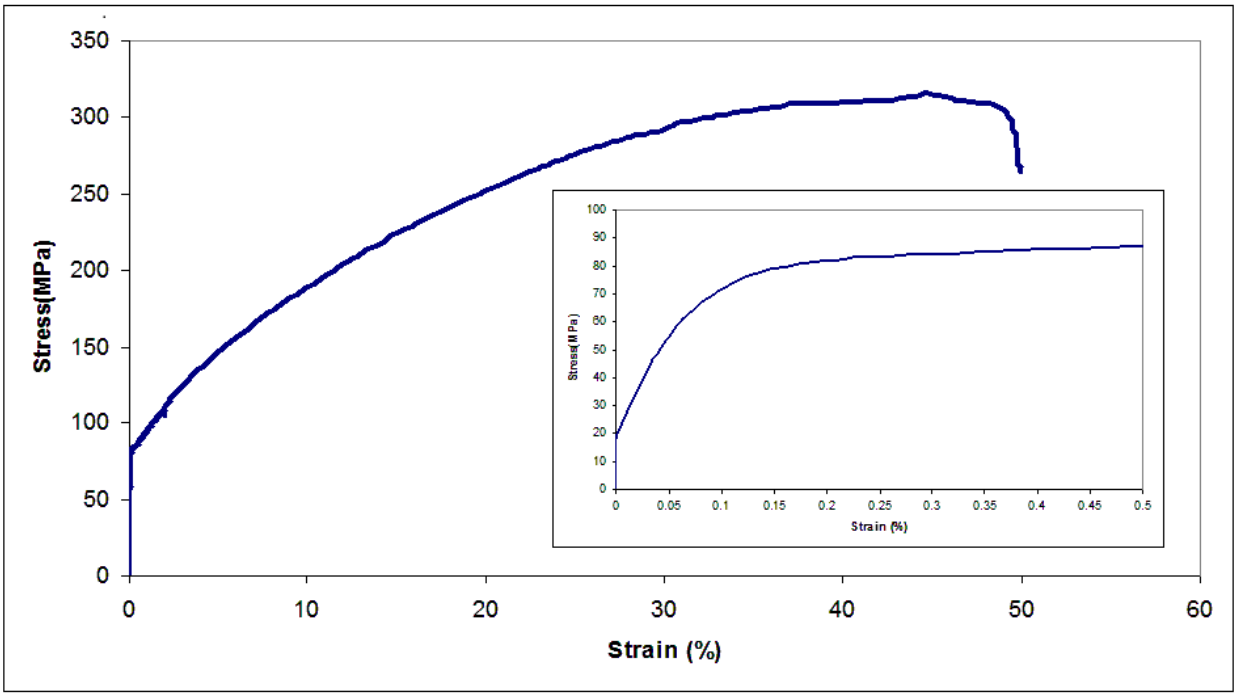
b) Put the steps in order.



Using the stress-strain curves above determine the ductility as either

☐ the strain after failure
☐ the strain at UTS
☐ the strain at YS

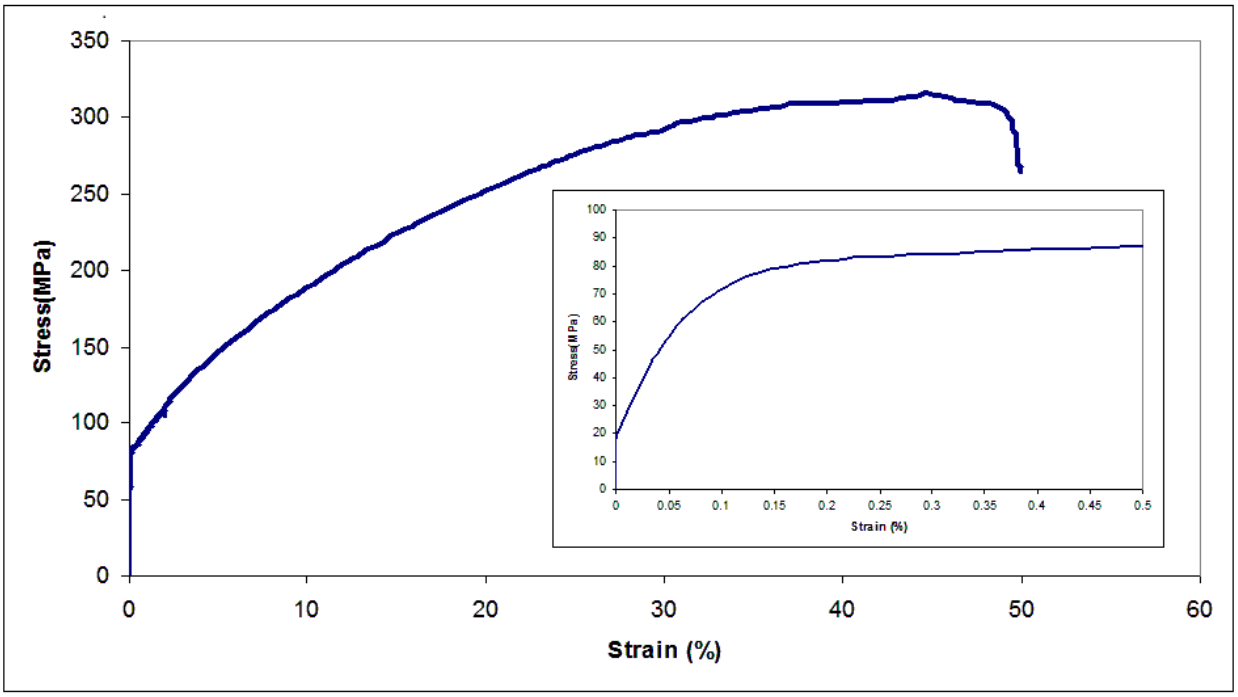
Report Values. Justify your answer and explain why the other two options are wrong.



Using the stress-strain curves above determine the modulus based on the following methods

- ☐ the initial slope
- ☐ the slope of the line used to determine the yield strength.

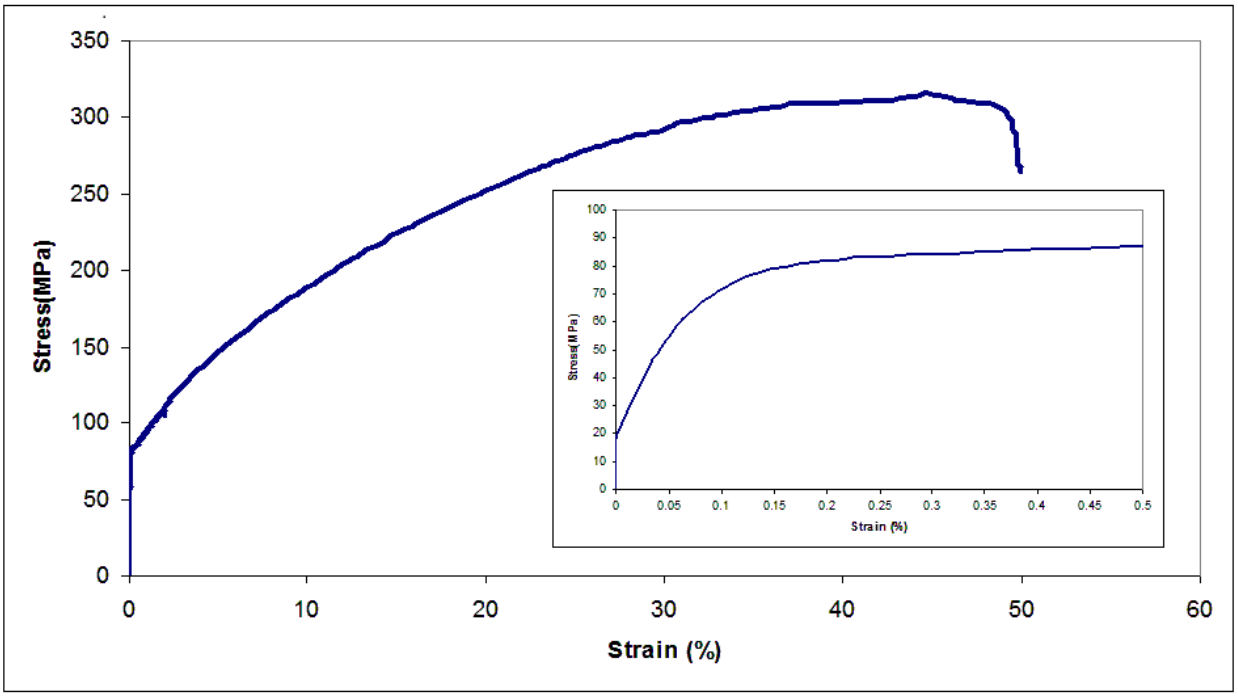
Report Values and explain both consistencies and inconsistencies which occur.



Using the stress-strain curves above determine the max strain as either

☐ the strain after failure
☐ the strain at UTS
☐ the strain at YS

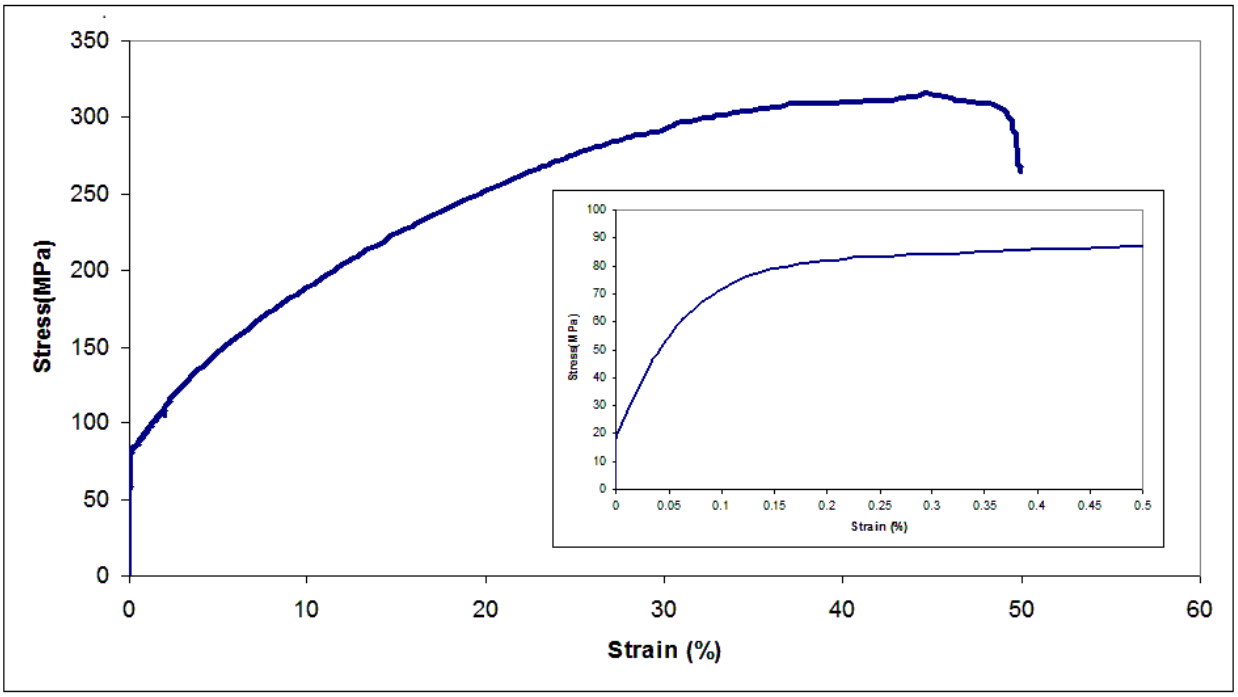
Report Values. Justify your answer and explain why the other two options are wrong.



Using the stress-strain curves above determine the UTS as either

- ☐ the stress at failure
- ☐ the stress at which permanent deformation begins
- ☐ the stress at which the permanent strain is equal to $2x10^{-3}$
- ☐ the stress at which the stress-strain curve becomes non-linear
- ☐ the maximum stress

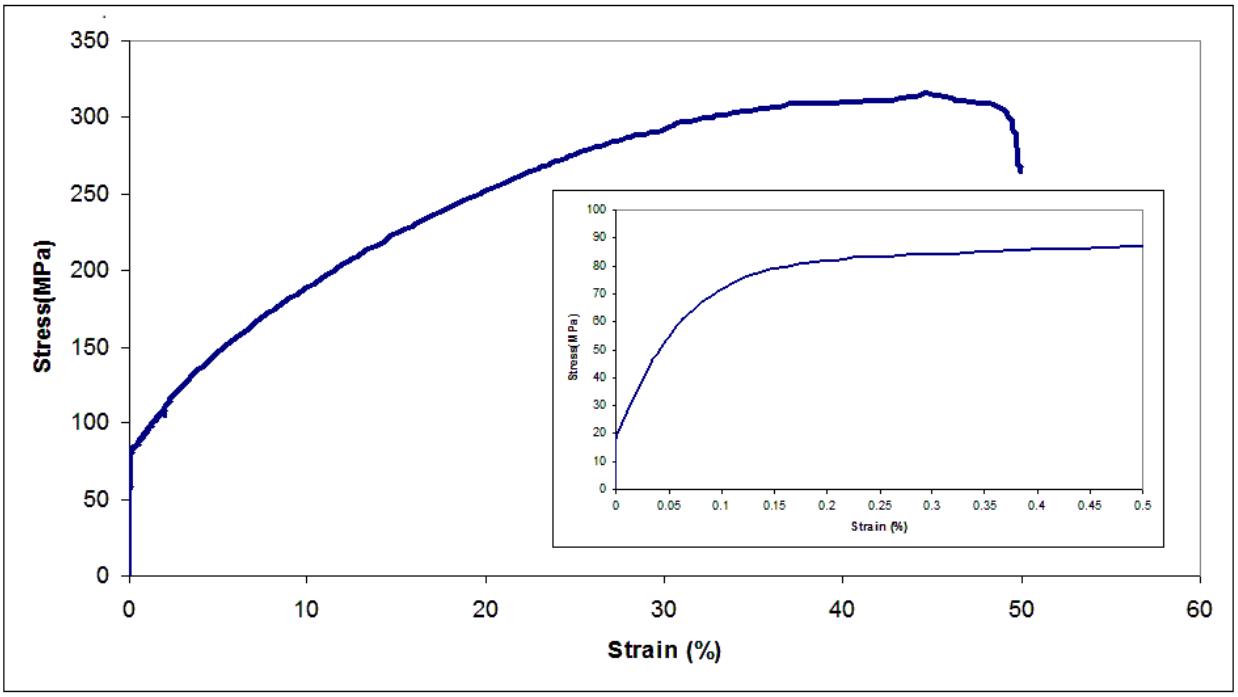
Report Values. Justify your answer and explain why the other options are wrong.



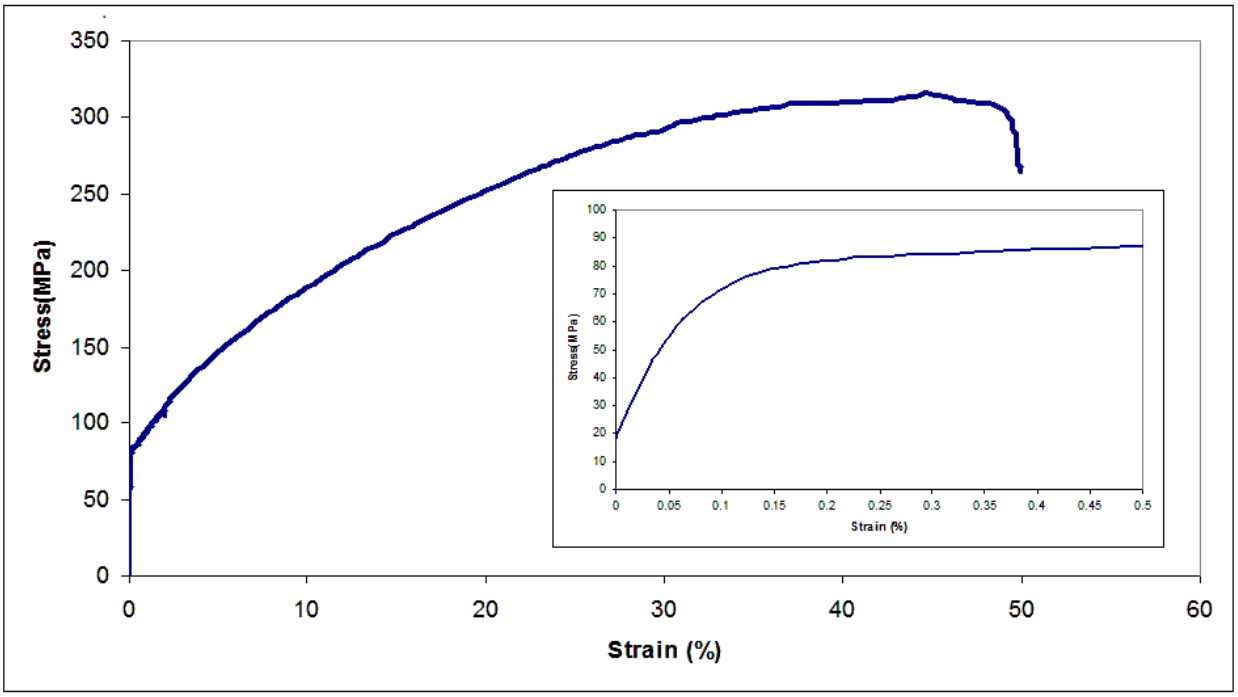
Using the stress-strain curves above determine the Yield Strength as either

☐ the stress at failure
☐ the stress at which permanent deformation begins
☐ the stress at which the permanent strain is equal to $2x10^{-3}$
☐ the stress at which the stress-strain curve becomes non-linear
☐ the maximum stress

Report Values. Justify your answer and explain why the other options are wrong.



A bar of material has an initial length of 80cm and a cross-sectional area of 2.4cm^2. Compare the force required, length under load, and the increase in yield strength (compared to original as shown above) for materials created by work hardening the above material to 25% and 25% of max.



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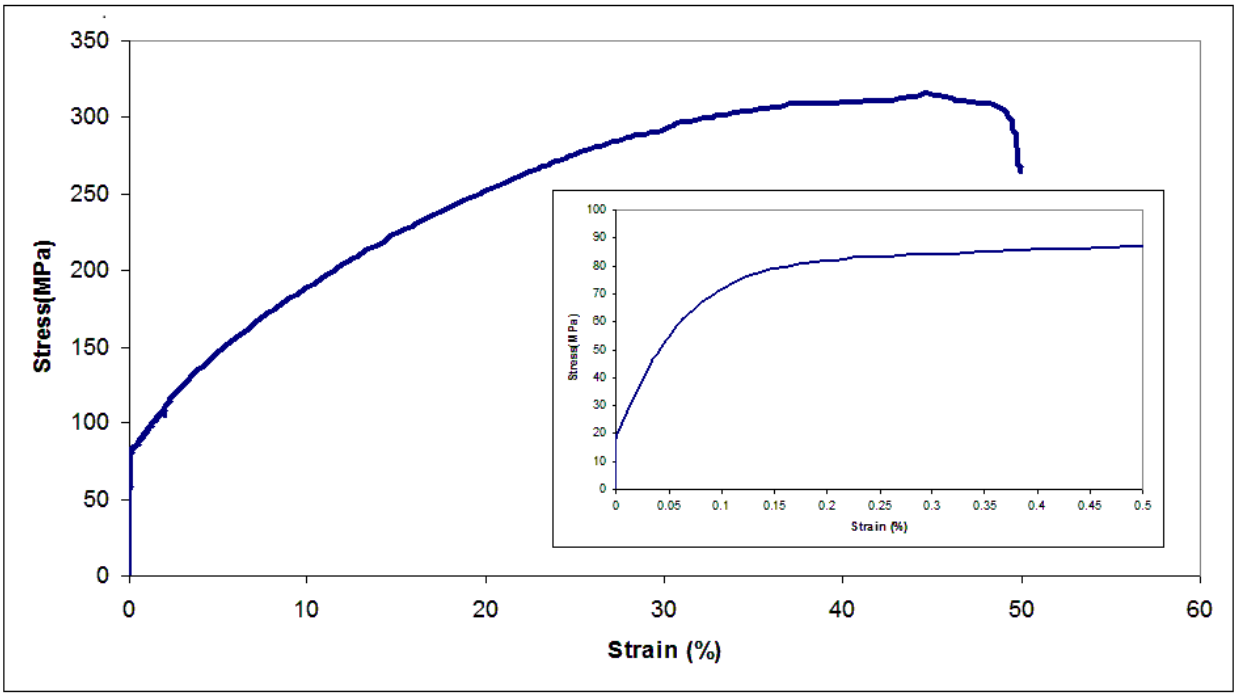

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