

MACHINIST'S DRAWINGS

- As a designer, your main job is to make sure the machinist/manufacturer doesn't have to guess or assume **anything**.
- The drawing must show everything, and it must show it as you actually want it to be.
- Don't tell the machinist "add a thing here" without showing the details!

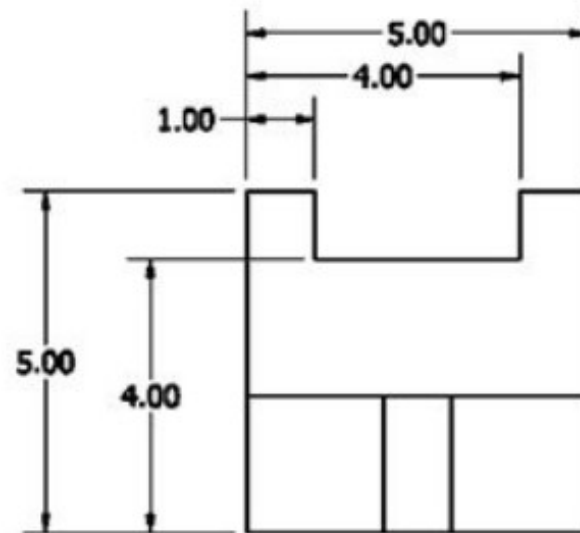
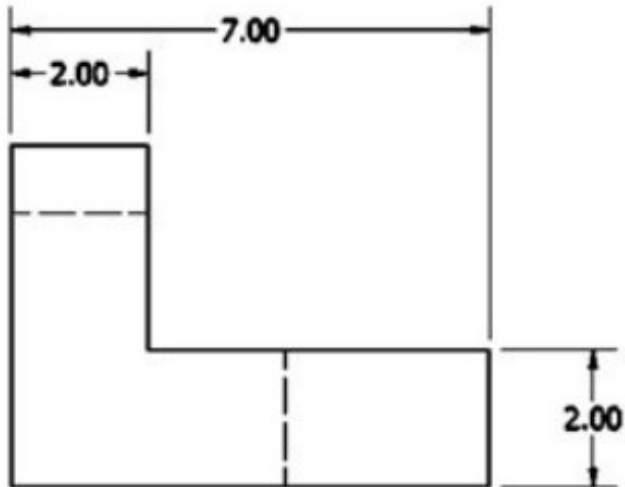
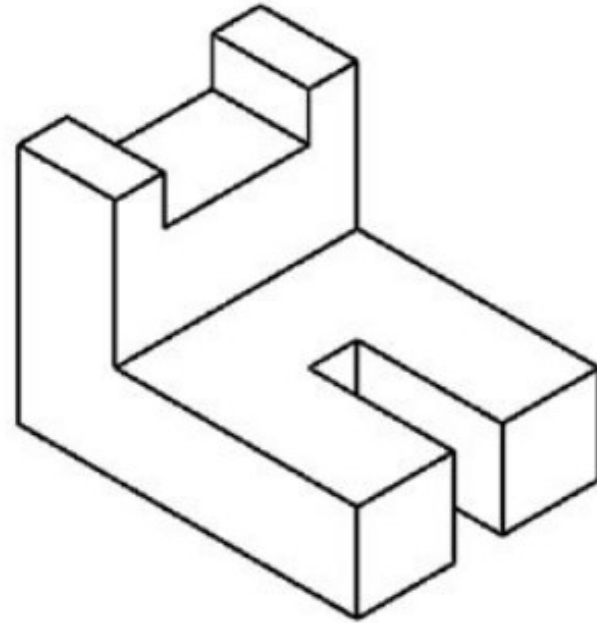
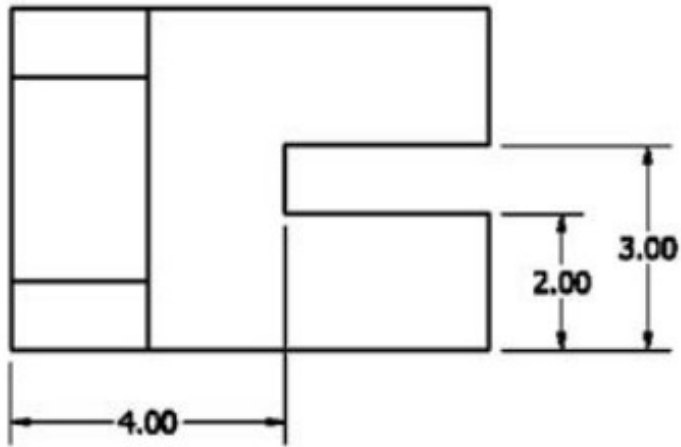
“TO SCALE”

- All Drawings are “to scale”. Period.
- This does NOT mean “full size”.
- This DOES mean “in the correct proportions”.

SOFTWARE VS. PENCIL

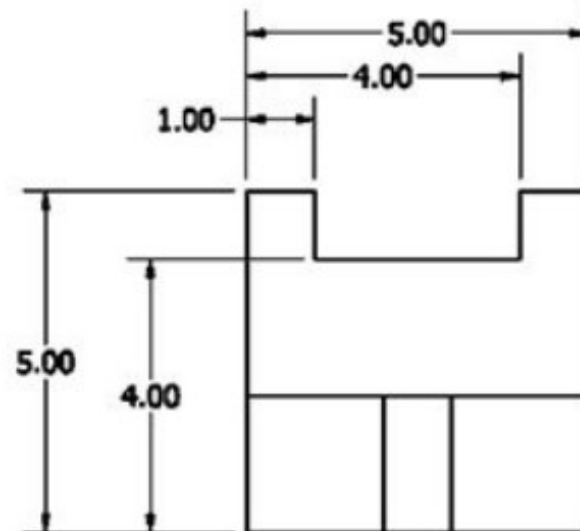
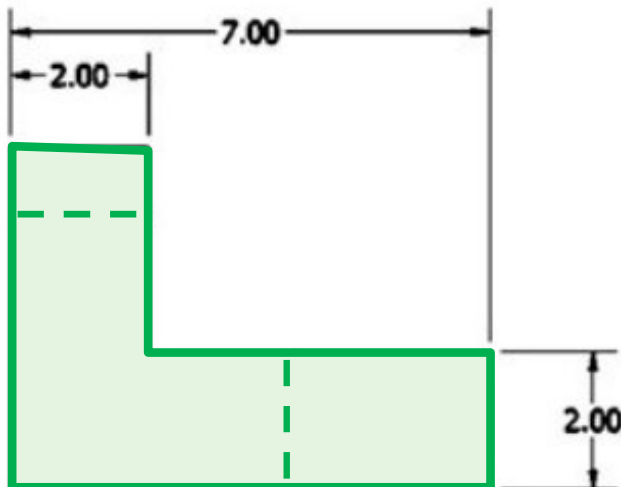
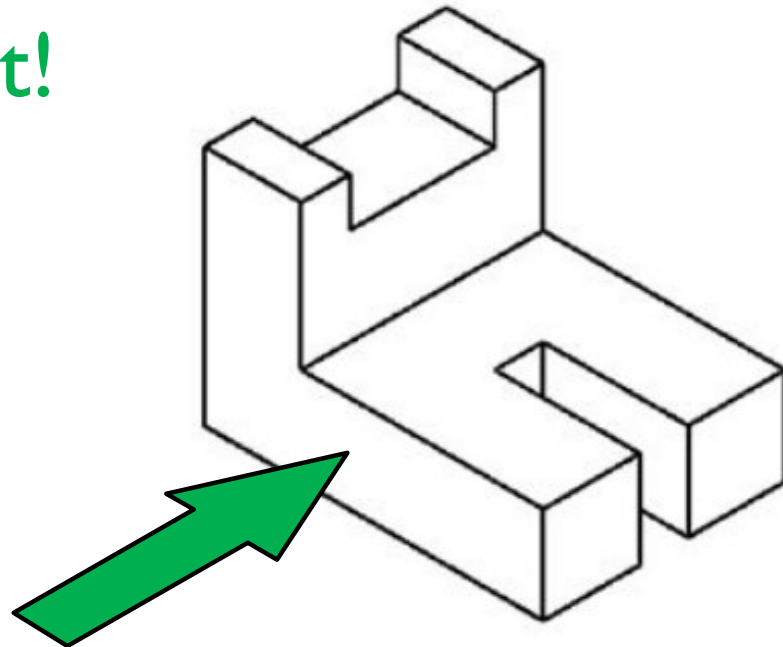
- Software will usually slow you down unless you are already an expert.
- If you are making one drawing to make one object, just use a pencil with a ruler.
- Dr. McLean does not care if your lines have a small wobble, or if your corners aren't perfect.

3-VIEW DRAWINGS

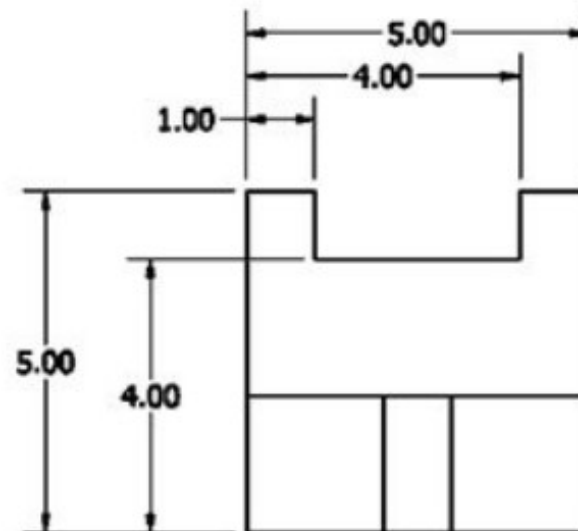
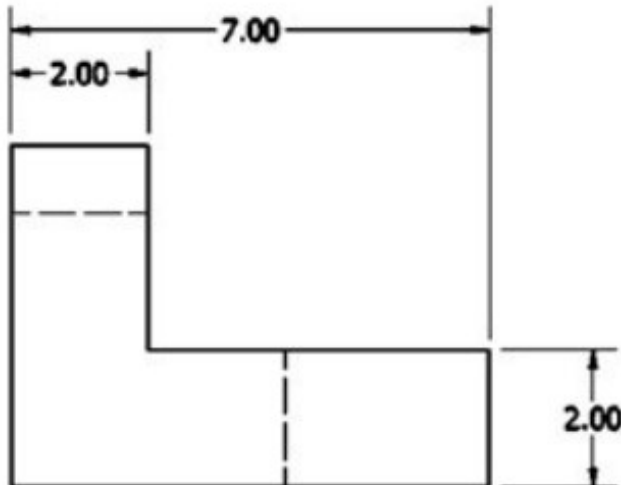
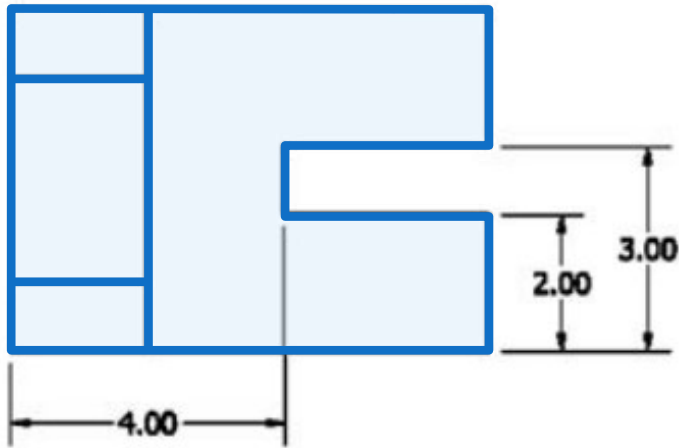
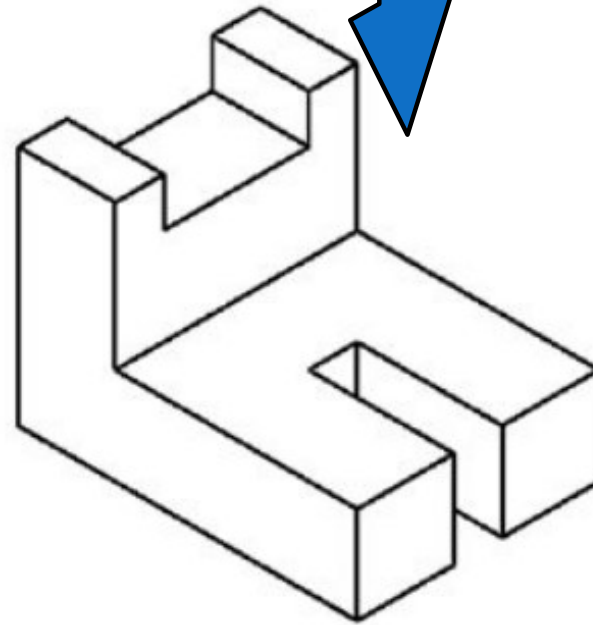


FRONT VIEW

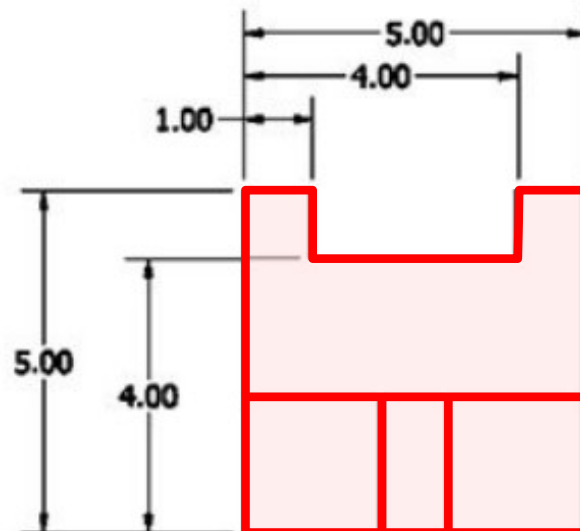
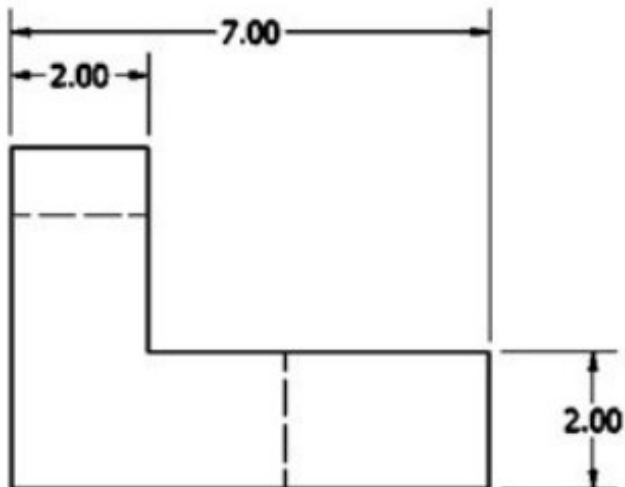
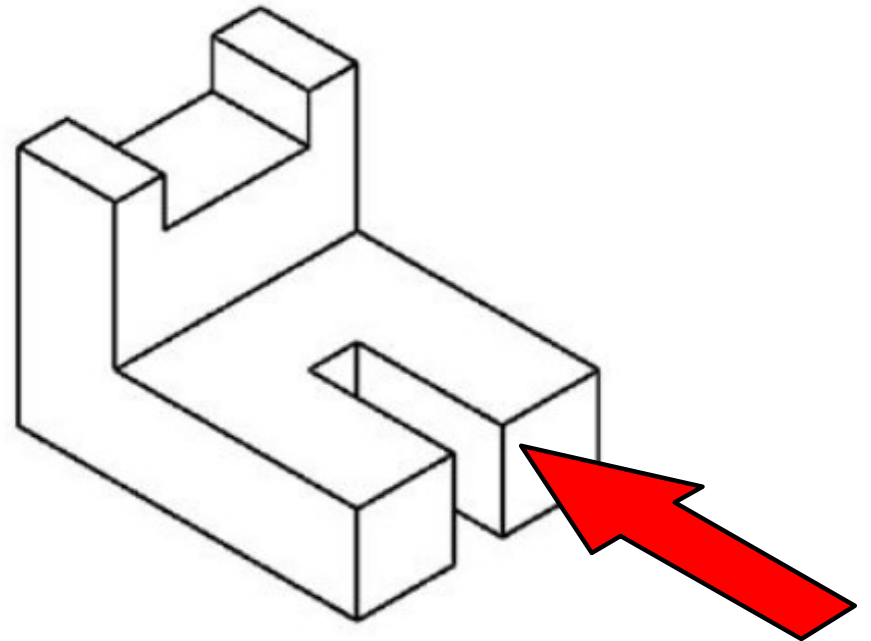
Most important!



TOP VIEW

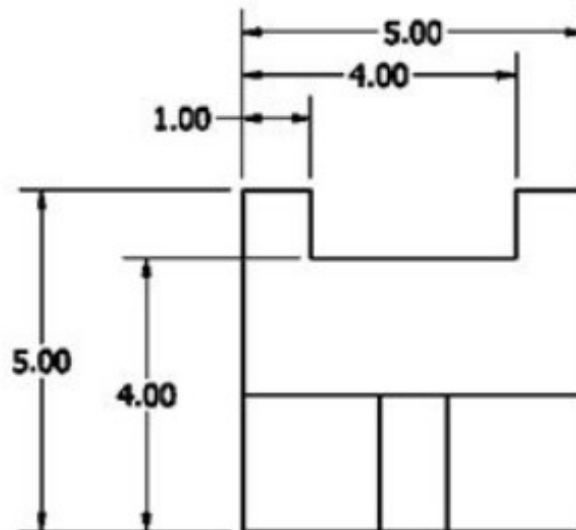
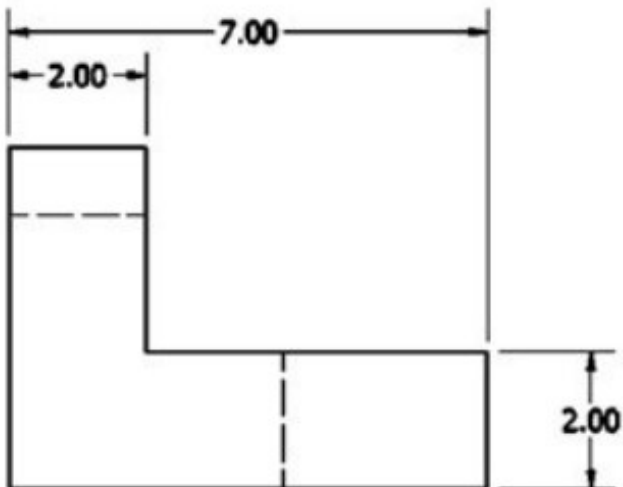
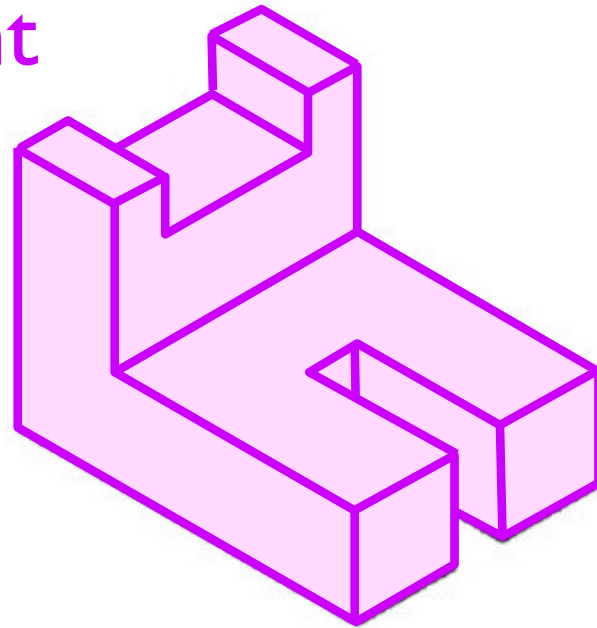


SIDE VIEW



ISOMETRIC VIEW?

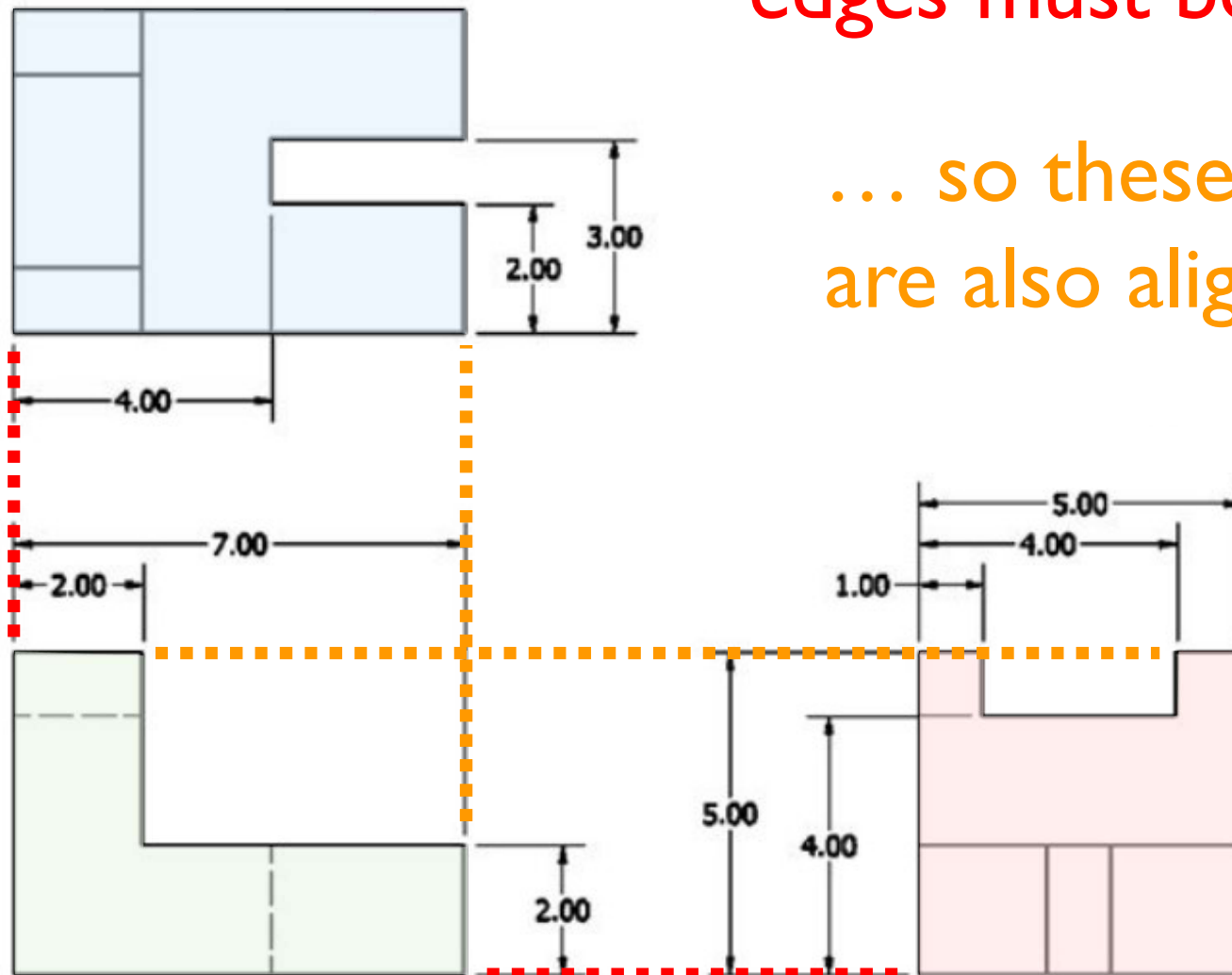
Not very important
for the machinist!



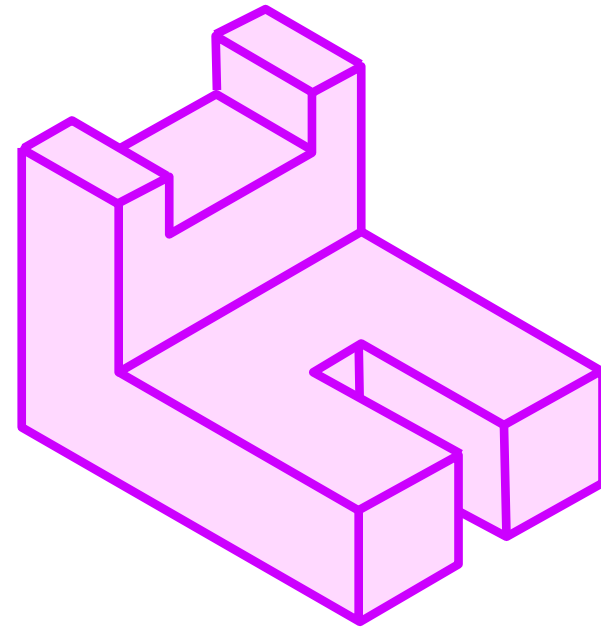
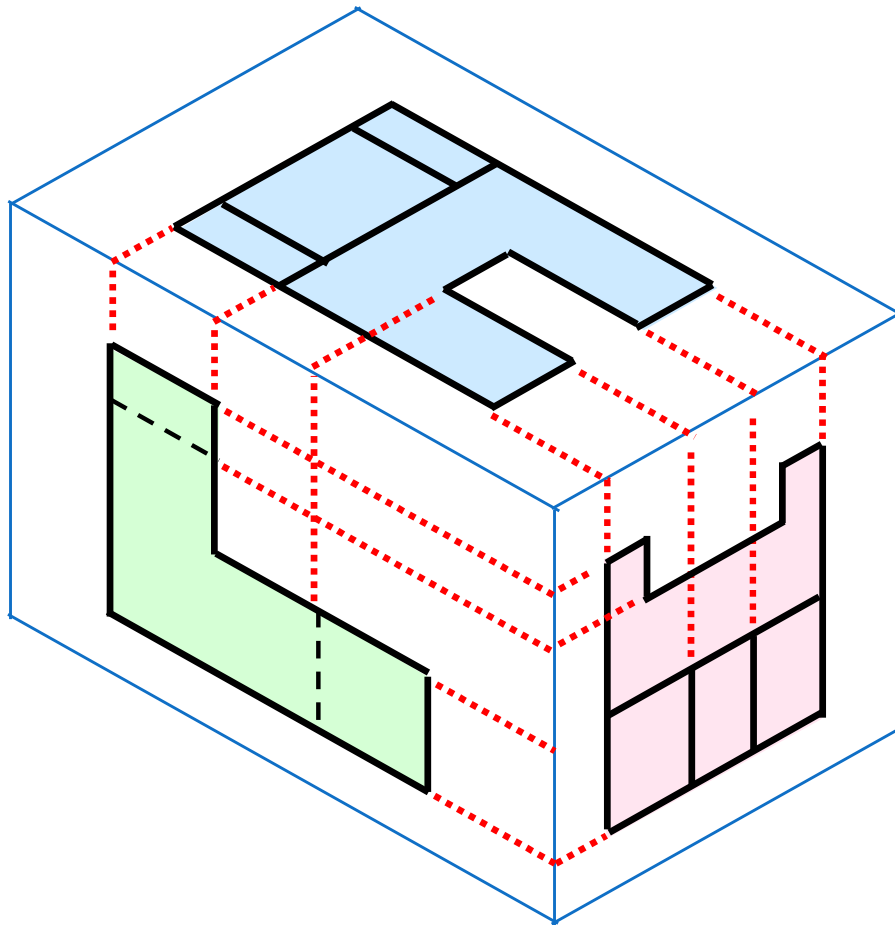
3-VIEW ALIGNMENT

The bottoms and left edges must be aligned.

... so these edges are also aligned...



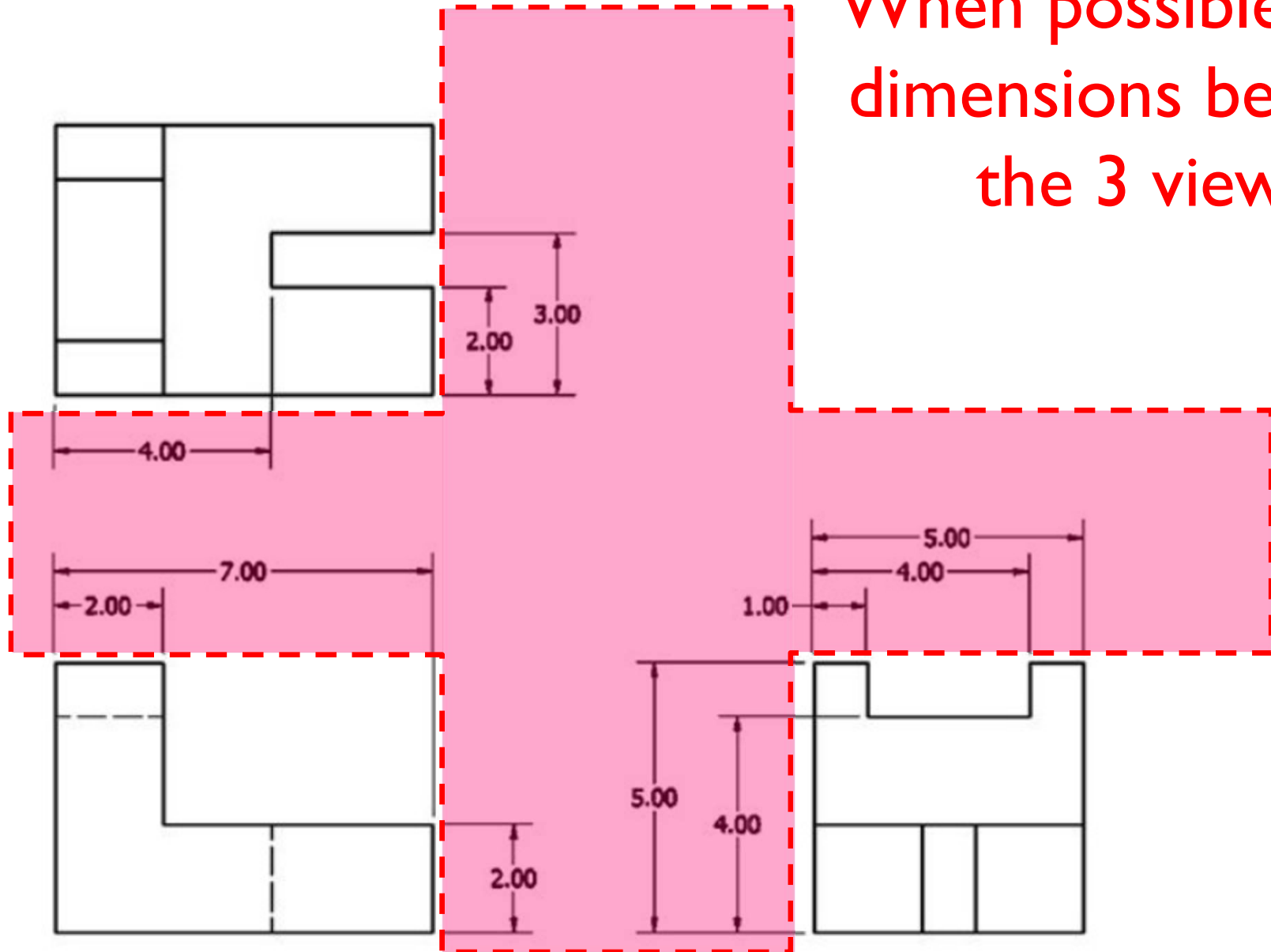
Orientation of the 3 Views:



When “folded”,
they align as they
would be seen.

DIMENSIONS

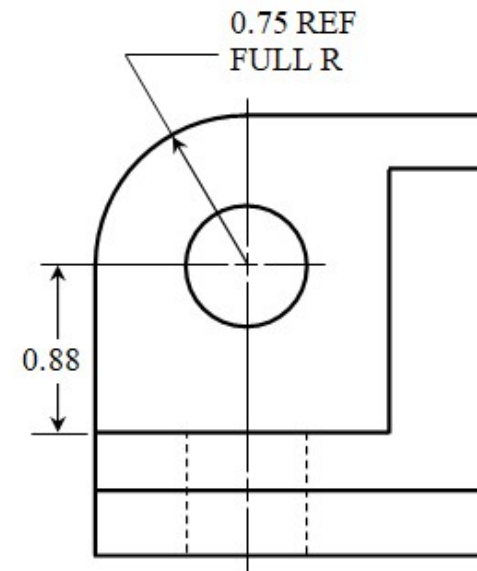
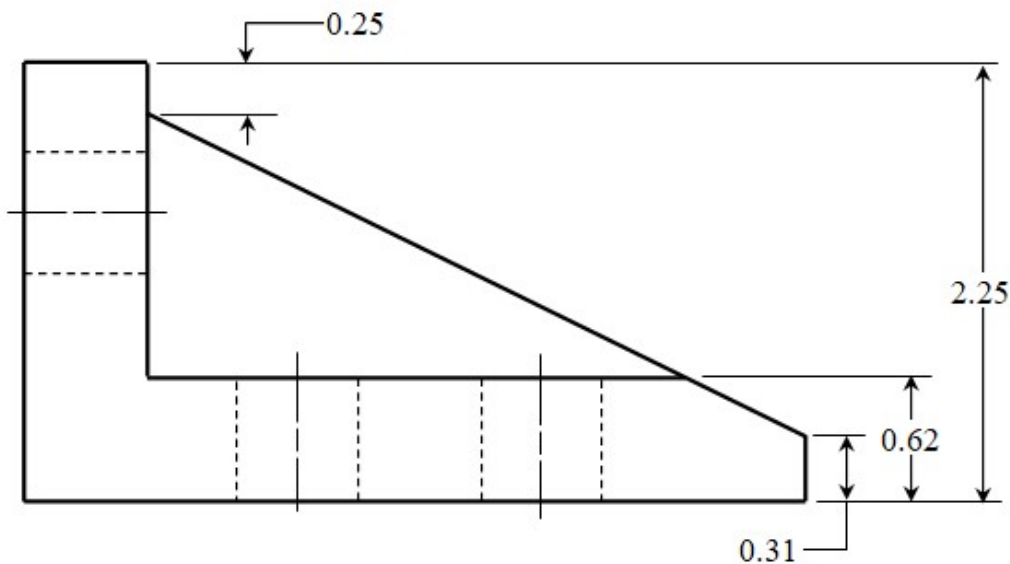
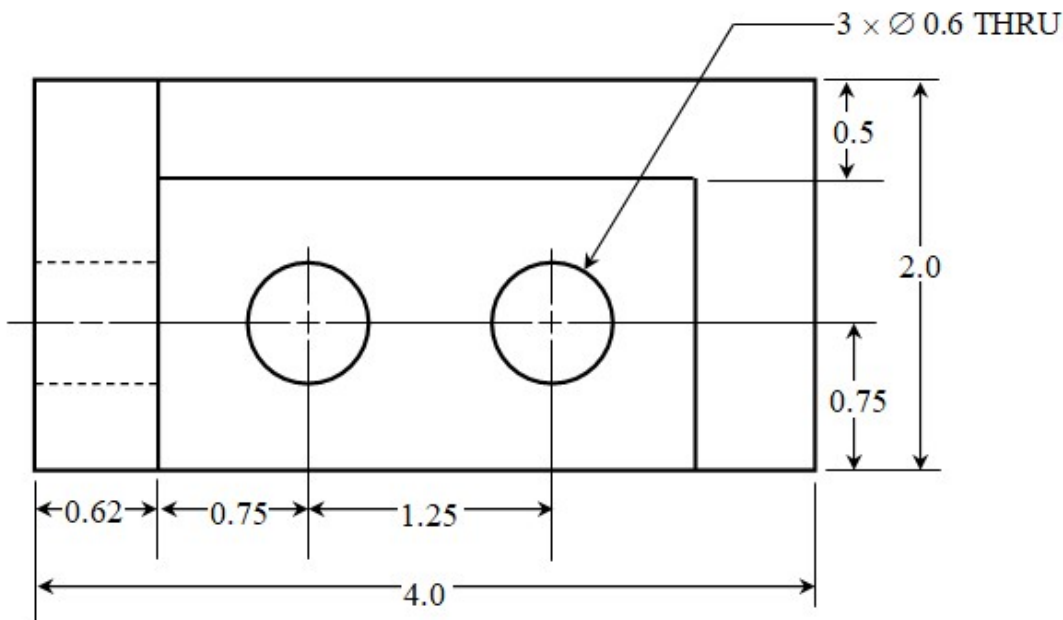
When possible, place dimensions between the 3 views.



DIMENSION TO WHICH VIEW?

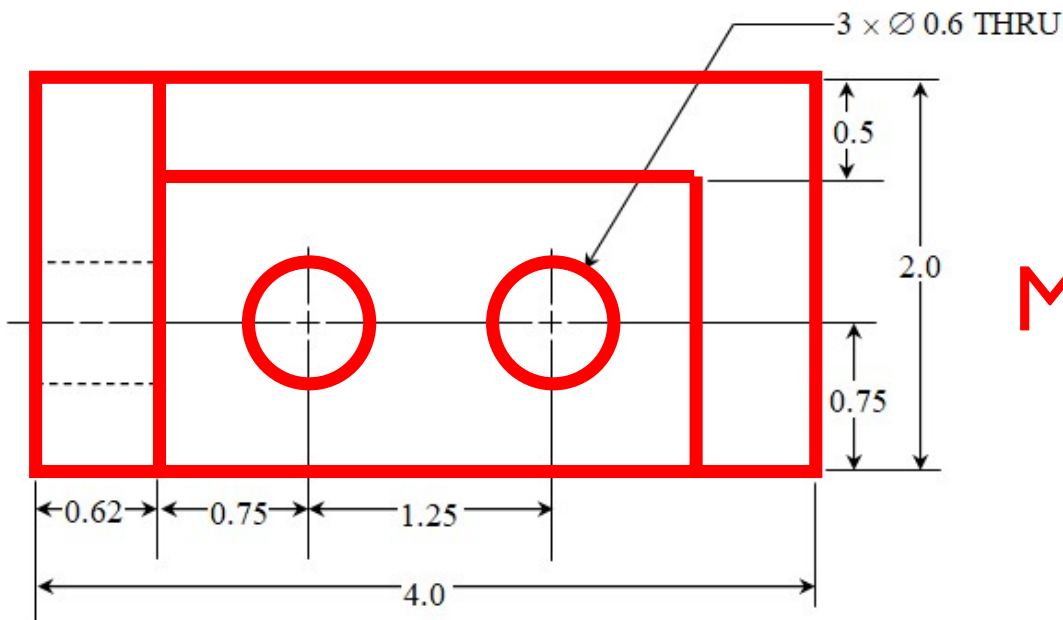
- Every feature that can be dimensioned appears on at least two views.
- Pick the view that's clearest.
- For holes and curves, that's **ALWAYS** the view that **LOOKS** curved!
- The position of a hole is always shown using the **center** of the hole, not an edge.
- Try to choose the view that avoids extension lines that penetrate the object.

Line Types...

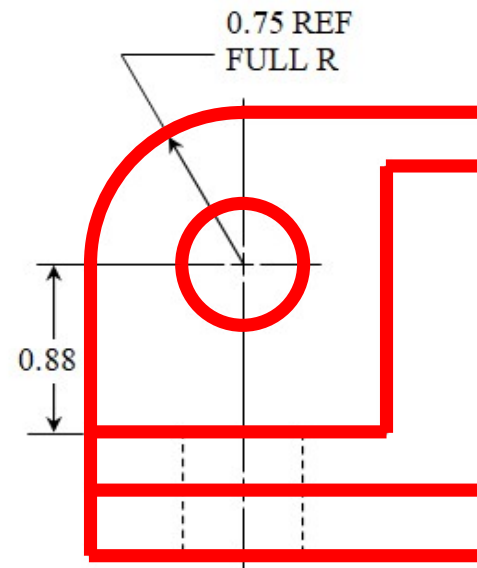
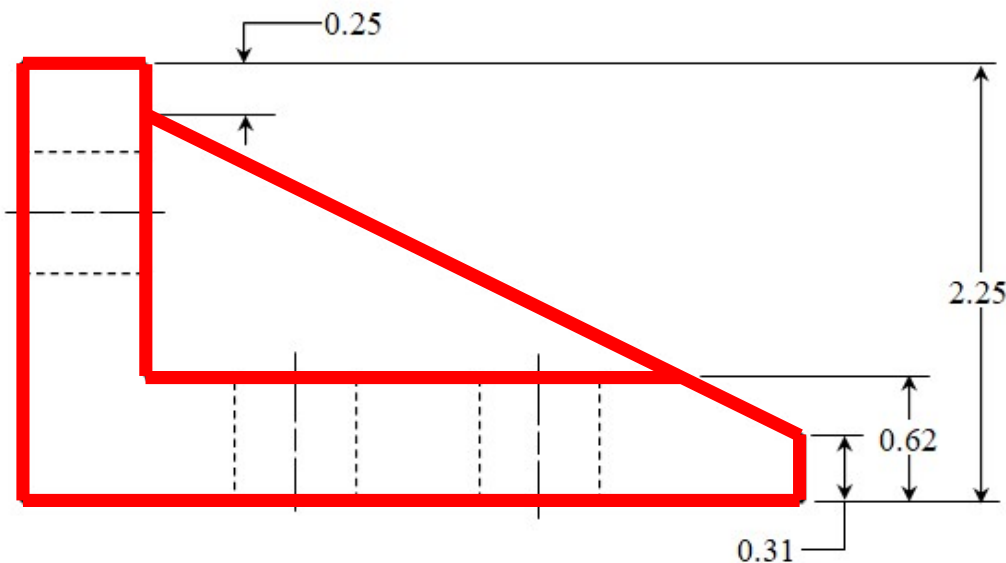


ALL DIMENSIONS IN INCHES

PART: WEDGE THING	
PROJECT: ASSIGN 3	
MAT'L: ALUMINUM	REV: 1
DR. BY: POGO	
DATE: SEP 2017	SCALE: 1:1

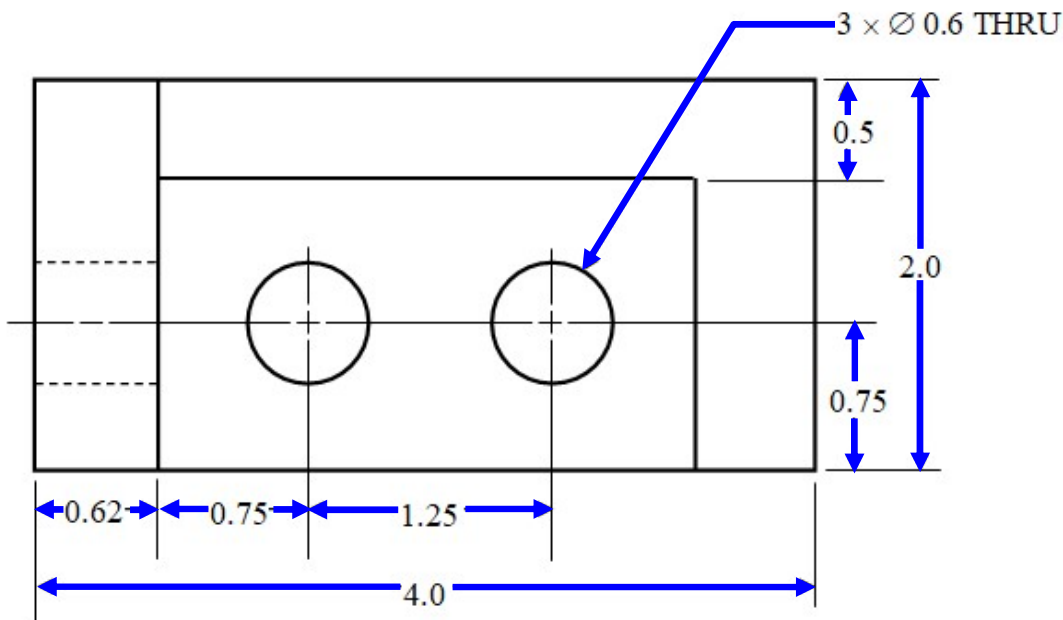


Object Lines:
 “What you see”.
MUST be heaviest. So
 once “finalized”,
 trace again darker.

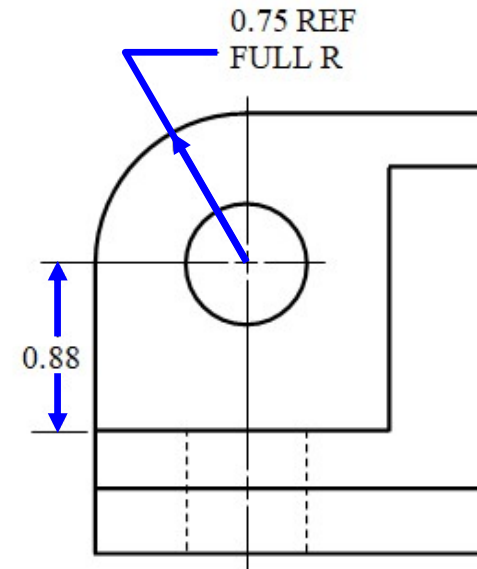
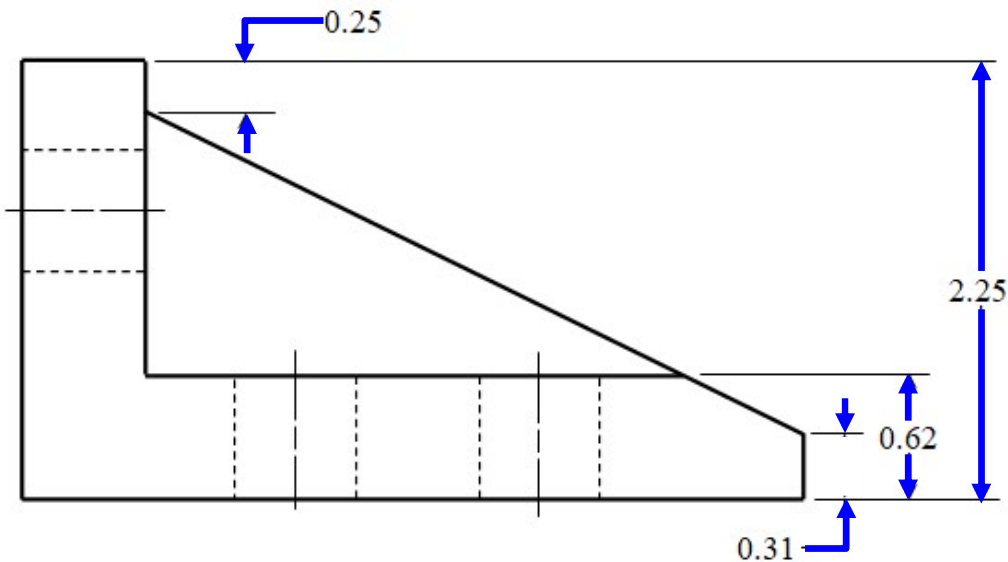


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PART: WEDGE THING	
PROJECT: ASSIGN 3	
MAT'L: ALUMINUM	REV: 1
DR. BY: POGO	
DATE: SEP 2017	SCALE: 1:1

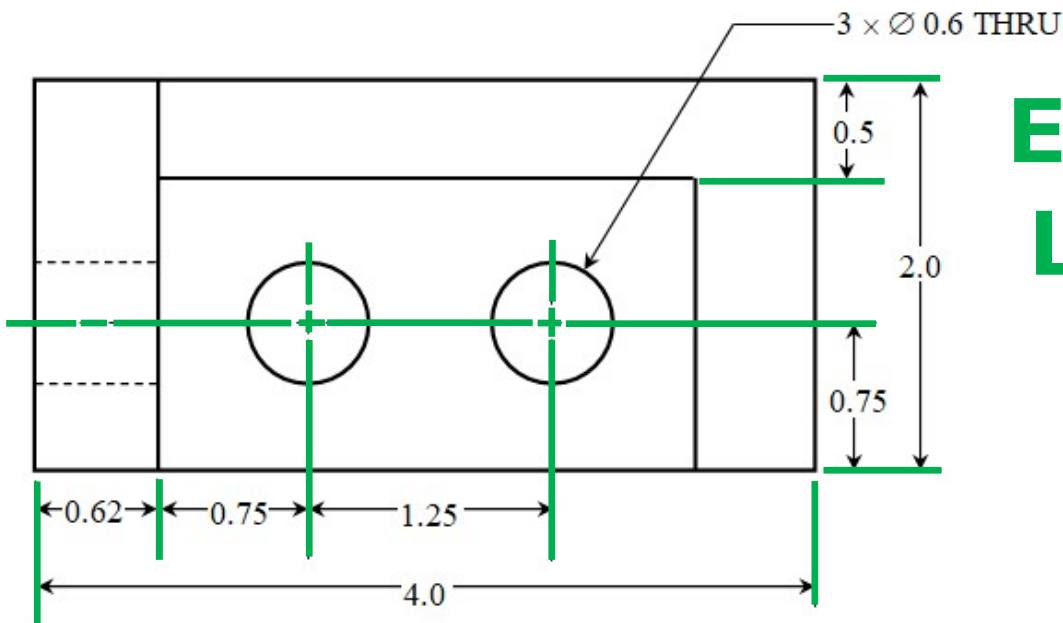


Dimension Lines:
MUST have arrows
 and a number.
 They may not cross
 each other!

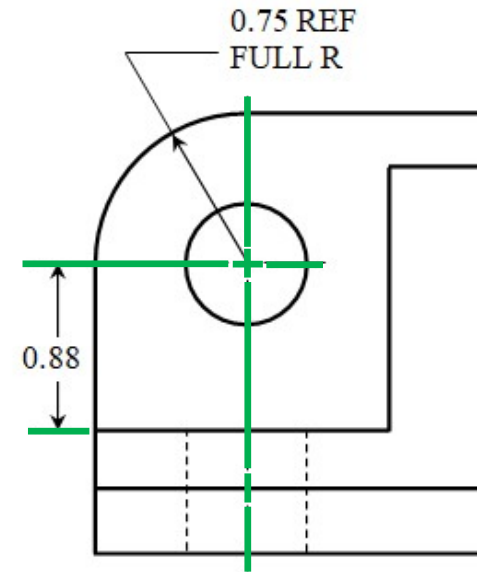
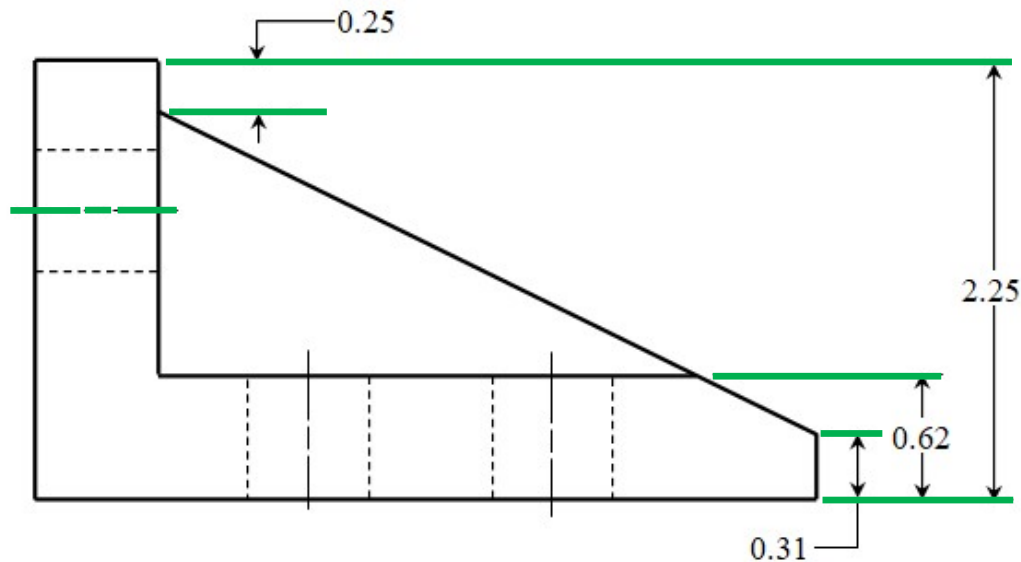


ALL DIMENSIONS IN INCHES

PART: WEDGE THING	
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MAT'L: ALUMINUM	REV: 1
DR. BY: POGO	
DATE: SEP 2017	SCALE: 1:1

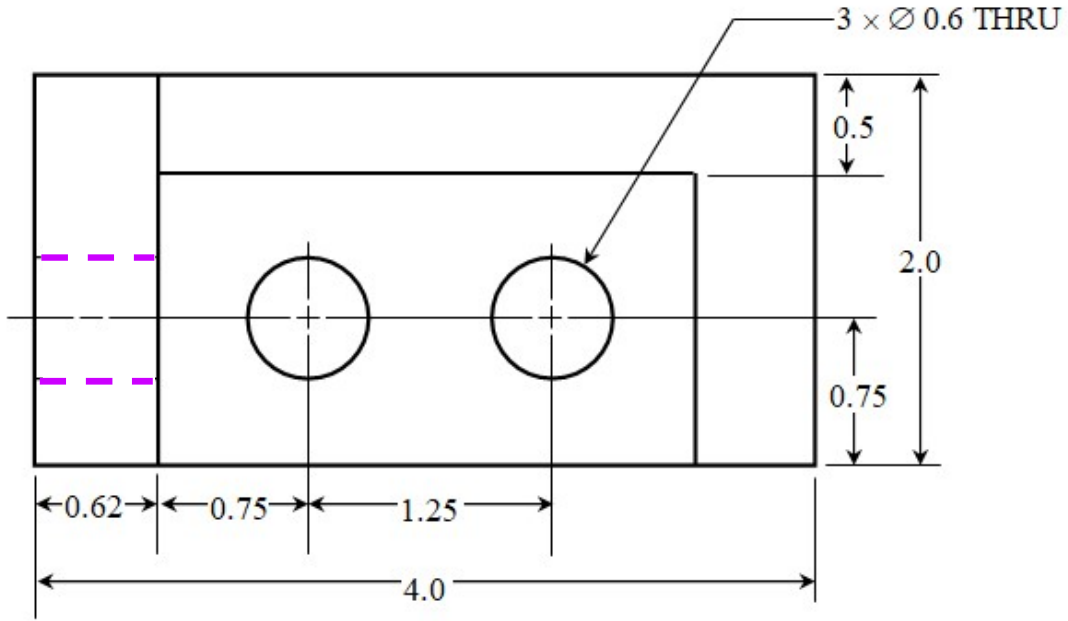


Extension & Center Lines: Provide access to dimension lines.

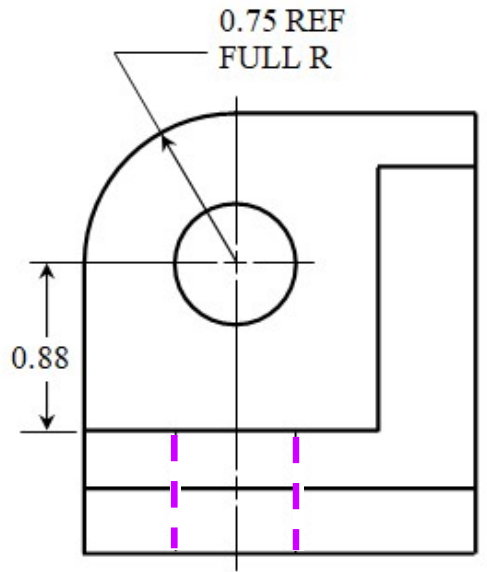
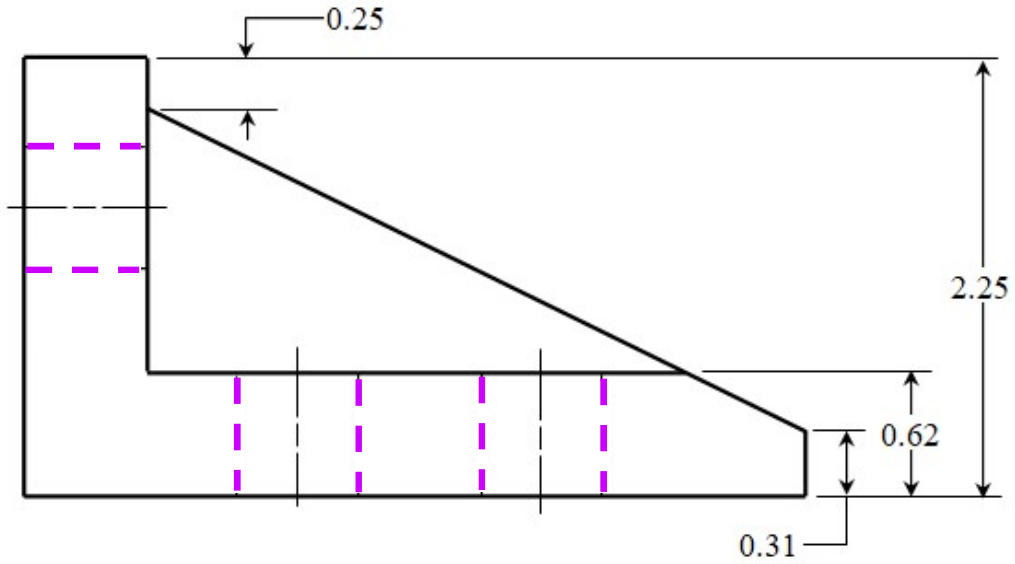


ALL DIMENSIONS IN INCHES

PART: WEDGE THING	
PROJECT: ASSIGN 3	
MAT'L: ALUMINUM	REV: 1
DR. BY: POGO	
DATE: SEP 2017	SCALE: 1:1

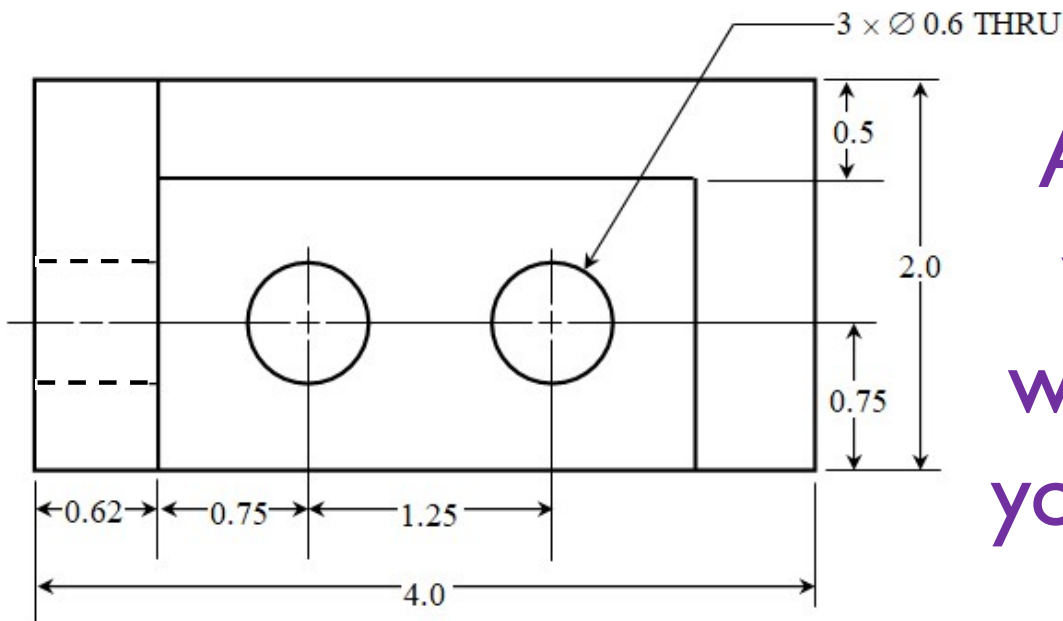


Hidden Lines:
 Use evenly spaced dashes.
 “X-Ray Vision”

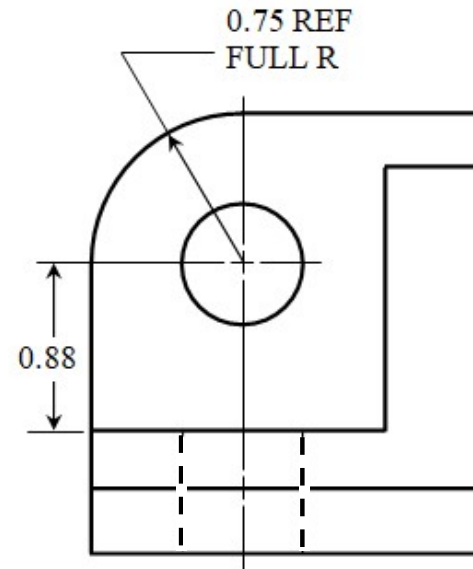
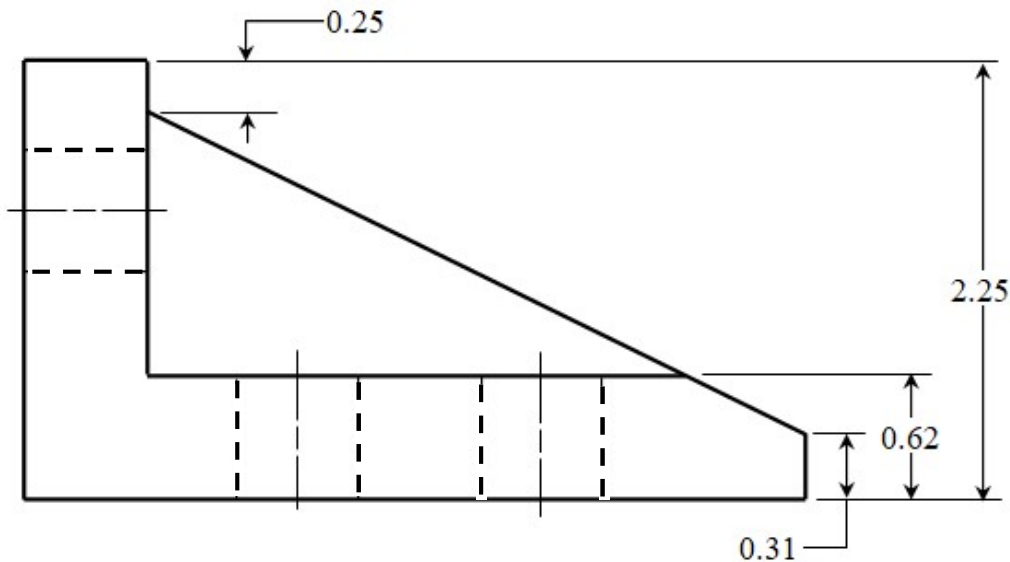


ALL DIMENSIONS IN INCHES

PART: WEDGE THING	
PROJECT: ASSIGN 3	
MAT'L: ALUMINUM	REV: 1
DR. BY: POGO	
DATE: SEP 2017	SCALE: 1:1



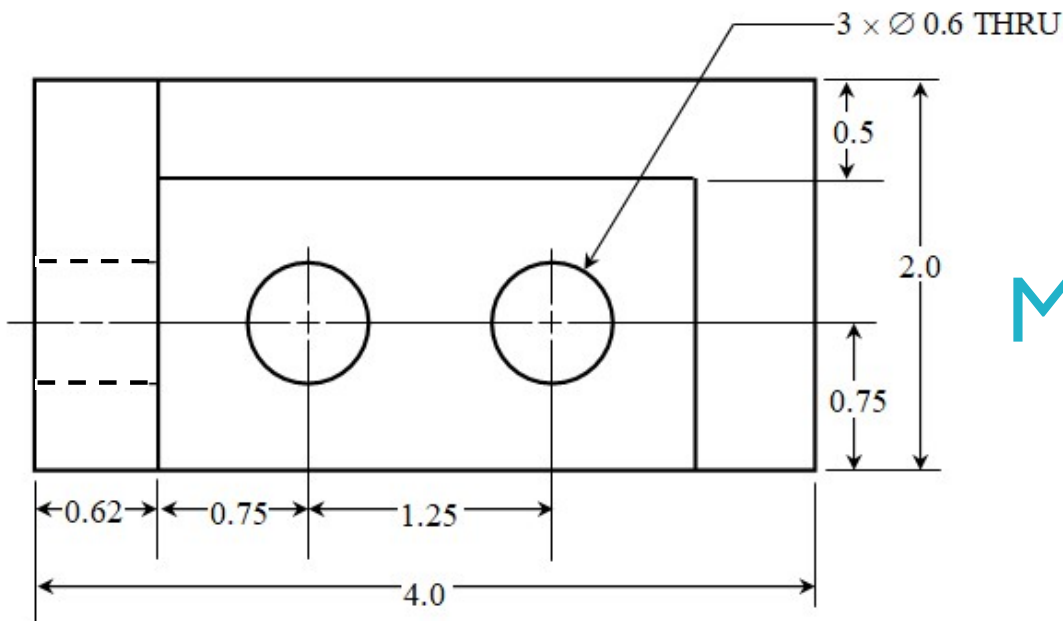
Tolerances...
 At Geneseo, assume
 your results will be
 within 0.005 inches of
 your stated dimension.



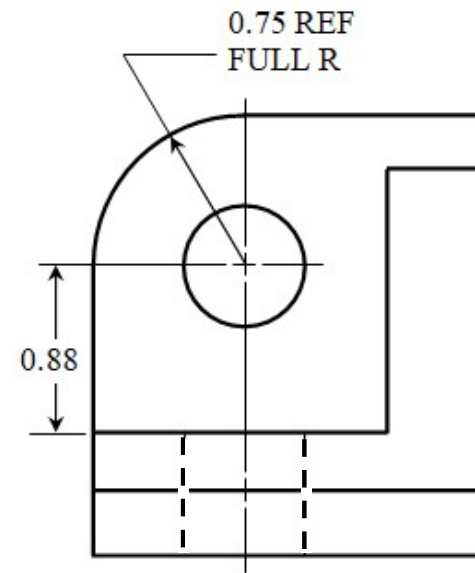
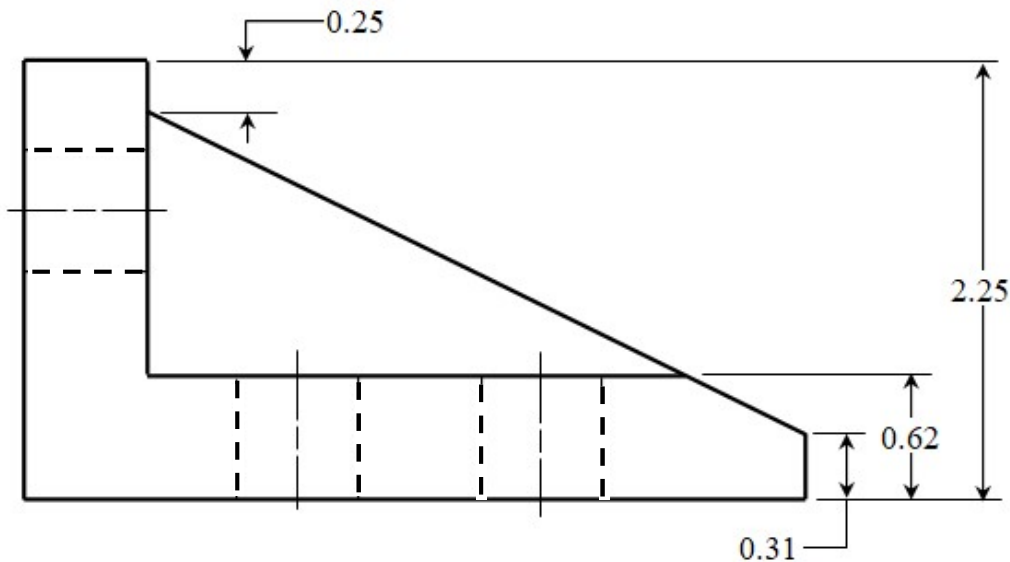
All dimensions ± 0.005 inches
 unless otherwise specified.

ALL DIMENSIONS IN INCHES

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DR. BY: POGO	
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Corner Block
 for global info:
 Material, Units, Author,
 Name, Date.



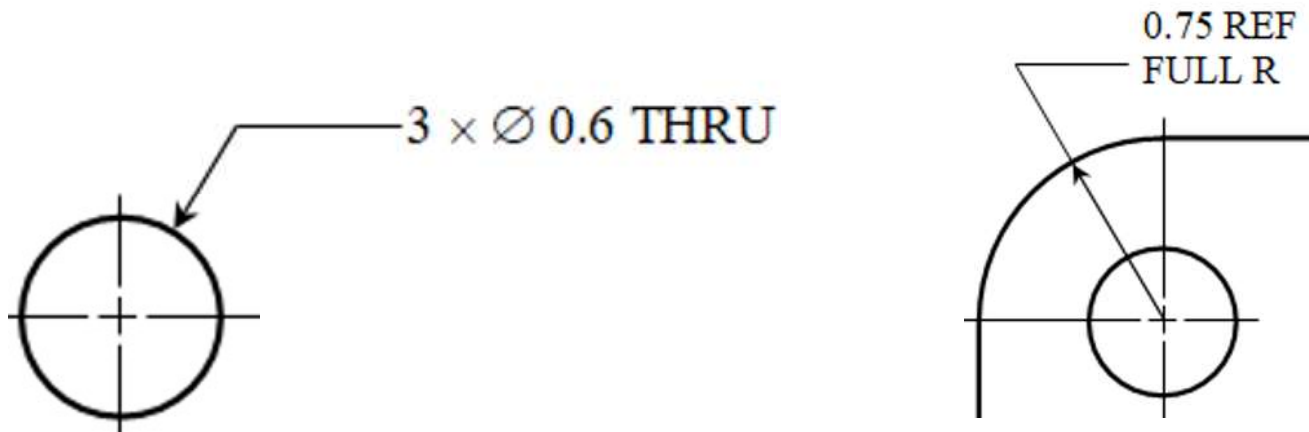
Inches currently preferred over mm...

ALL DIMENSIONS IN INCHES

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DR. BY: POGO	
DATE: SEP 2017	SCALE: 1:1

DIMENSION DETAILS

- Size of circles points radially *towards* the center, and shows **diameter**.
- This symbol means “diameter”: \varnothing
- Other curves point radially *outwards* from the center of the curve.
- They typically show **radius** (“R”)

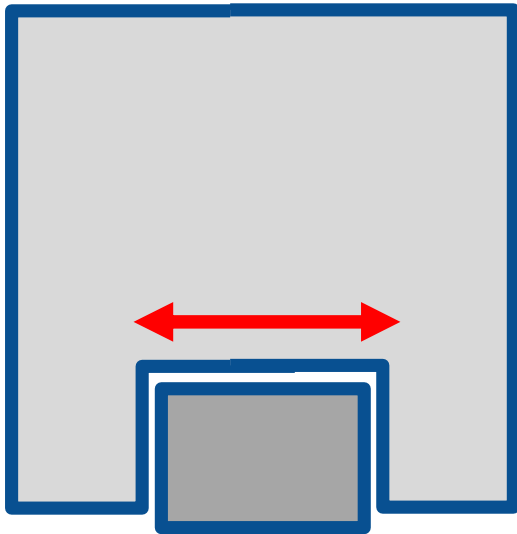


DIMENSION DETAILS II

- You may never include any dimension that is already listed somewhere else
- You may never include any dimension that can even be calculated from dimensions that are already listed!
- That's called "double dimensioning"

DIMENSION DETAILS III

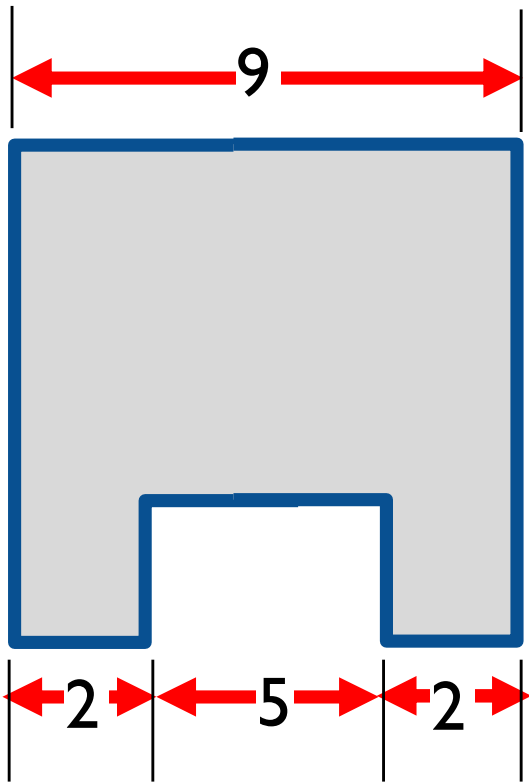
- When avoiding Double Dimensioning, always choose to include the most functional dimension possible...



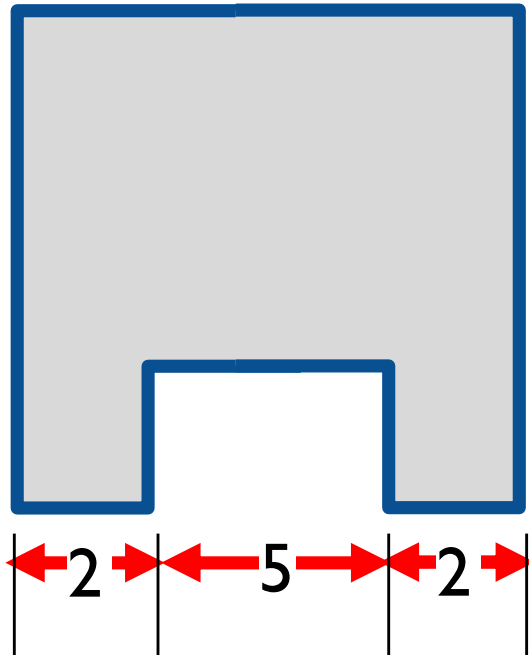
- If this light gray block is intended to slide on the dark block, then **this** is the important dimension.

DIMENSION DETAILS III

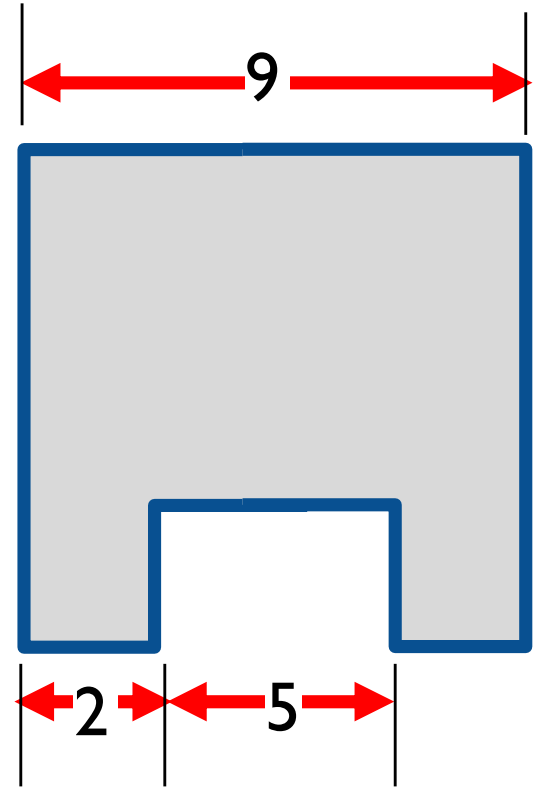
WRONG



FAIR

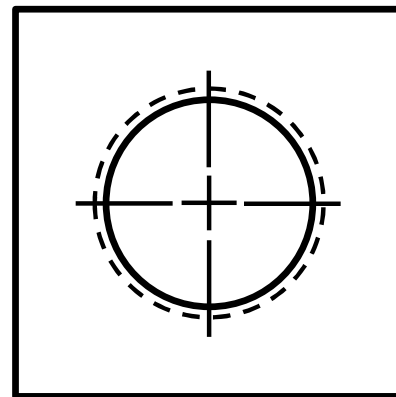
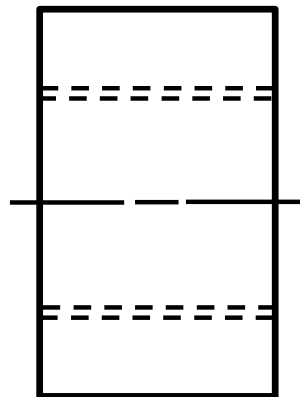
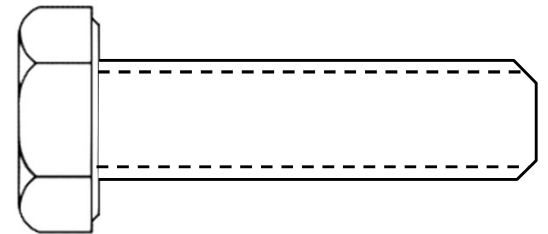
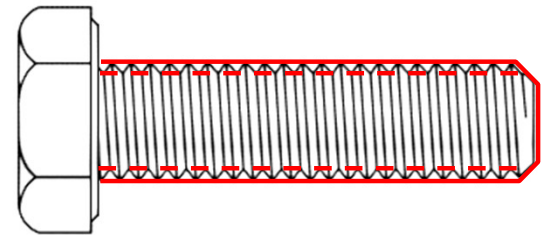
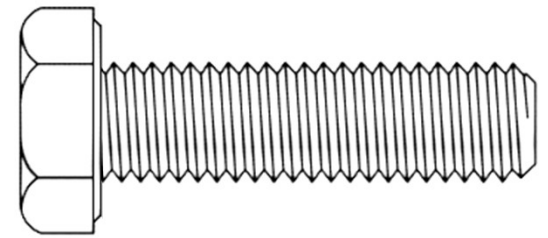


BEST



THREADS/SCREWS

- Most details usually not drawn
- Diameter and length always drawn
- Center line (with spaced dashes) is always drawn for holes!



THREAD DIMENSIONS

- Use “**A**” for “pegs”, and “**B**” for holes
- Don’t invent new threads... use UNC.
- Don’t ask machinist to create threaded pegs if it can be avoided... use a screw!

