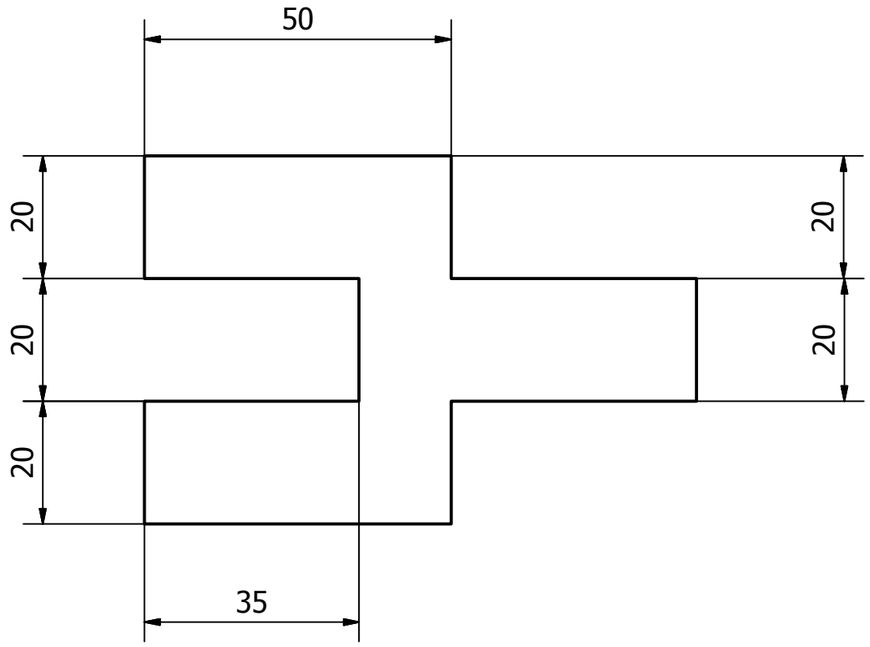
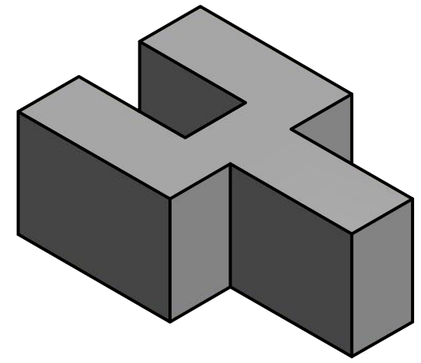
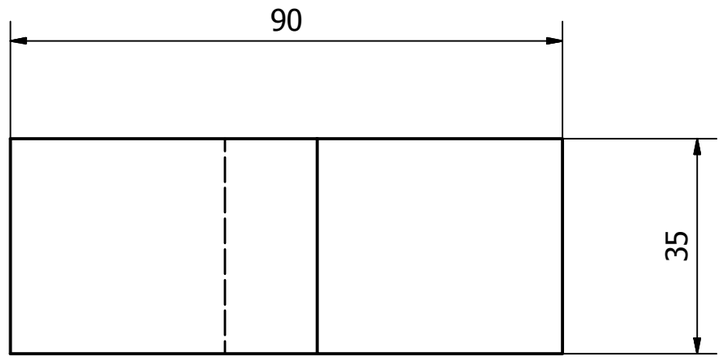
Inventor Exercises
(Fundamentals)

These drawings are to be modelled as 3D solid models using approprate software. (e.g. Autodesk Inventor)
Take care to keep files organised and save each file using suitable names. (Do not settle for the default names because these are asking to be over-written by accident)
Avoid renaming or moving files (other than whole folders) from Windows File Explorer because Inventor will lose track of them. (This is absolutely critical for assemblies)

Most exercises have a hint message, but more detailed help is available from the appropriate lessons e.g. (Lesson 16). These lesson numbers refer to the Lessons pdf file (turn on bookmarks to see the Lesson Index - lessons 1 to 20).







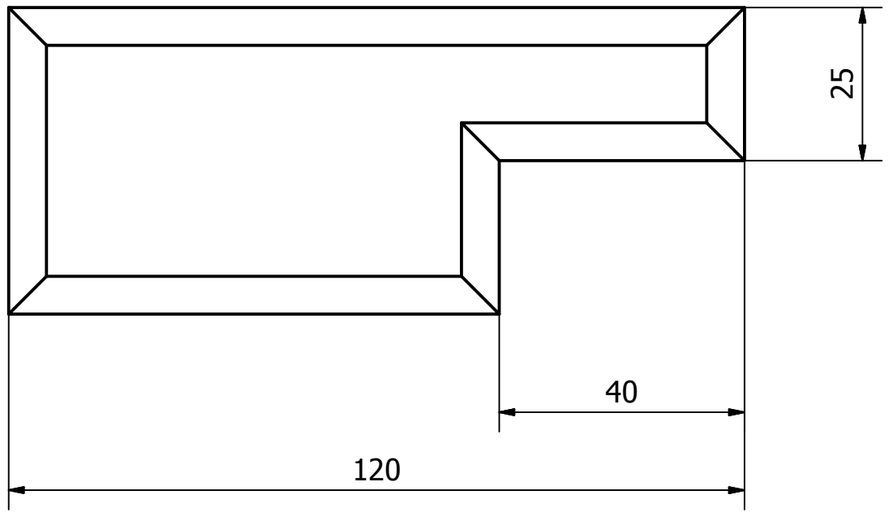
HINT

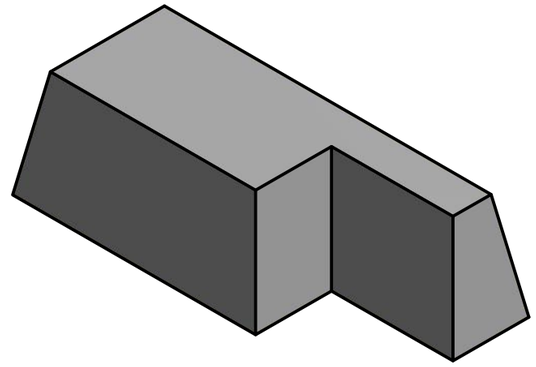
Draw the "Y" shaped sketch and extrude it 35mm. (Lesson 1,2,3)

MOUNT DRUITT COLLEGE OF TAFE

DETAIL DRAFTING

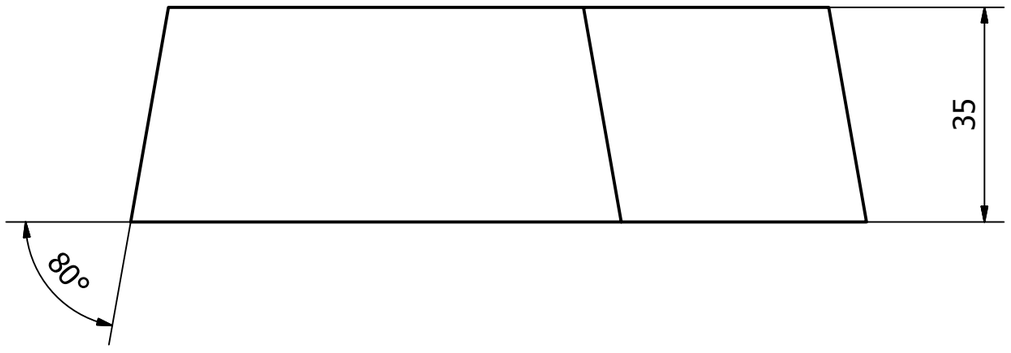
	DRAWN MCS	BLOCK	
	CHECKED		
	DATE AUG 2015	SCALE 1:1	DRAWING NO EXTRUDE_1

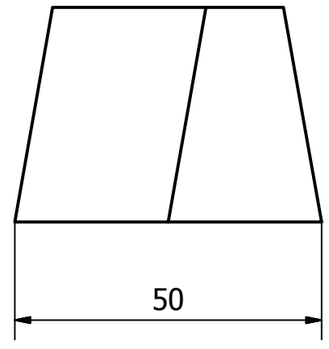




HINT

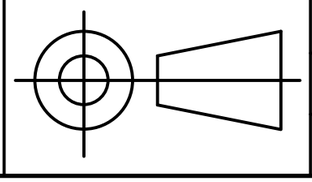
Draw the 120x50 profile then extrude with 10 degree taper - or negative taper if necessary. (Lesson 3)



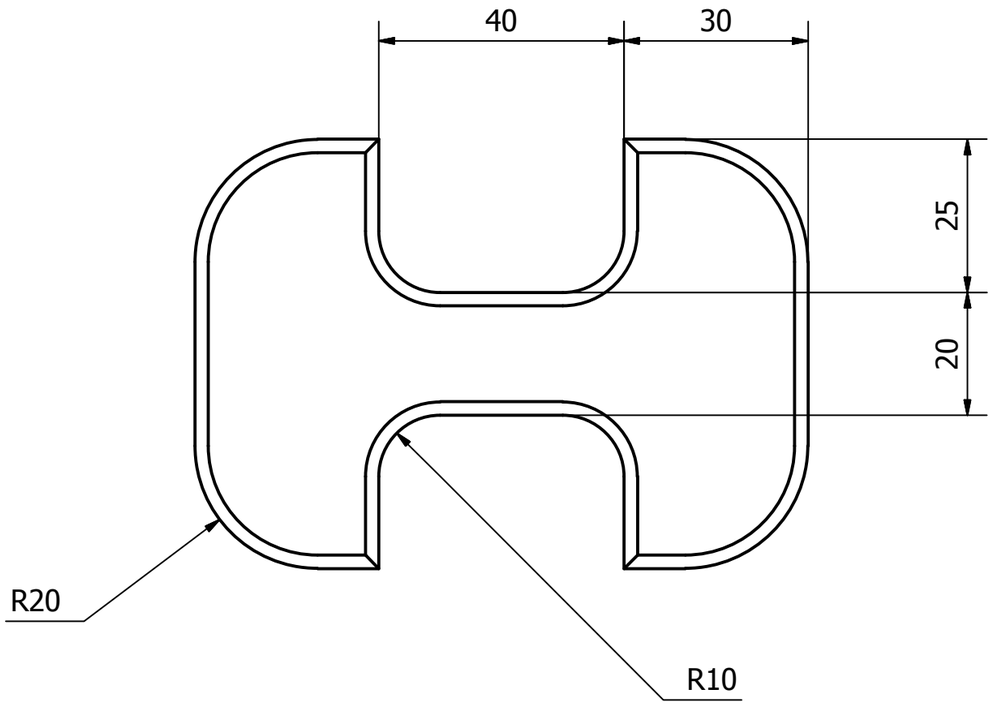


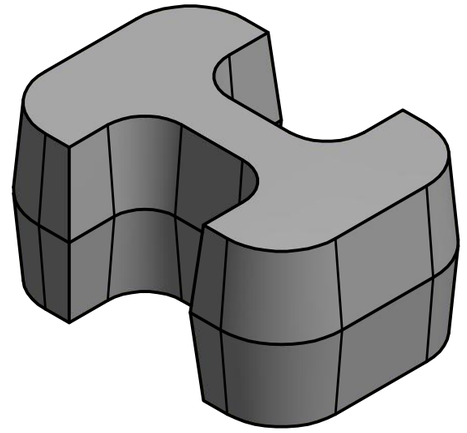
MOUNT DRUITT COLLEGE OF TAFE

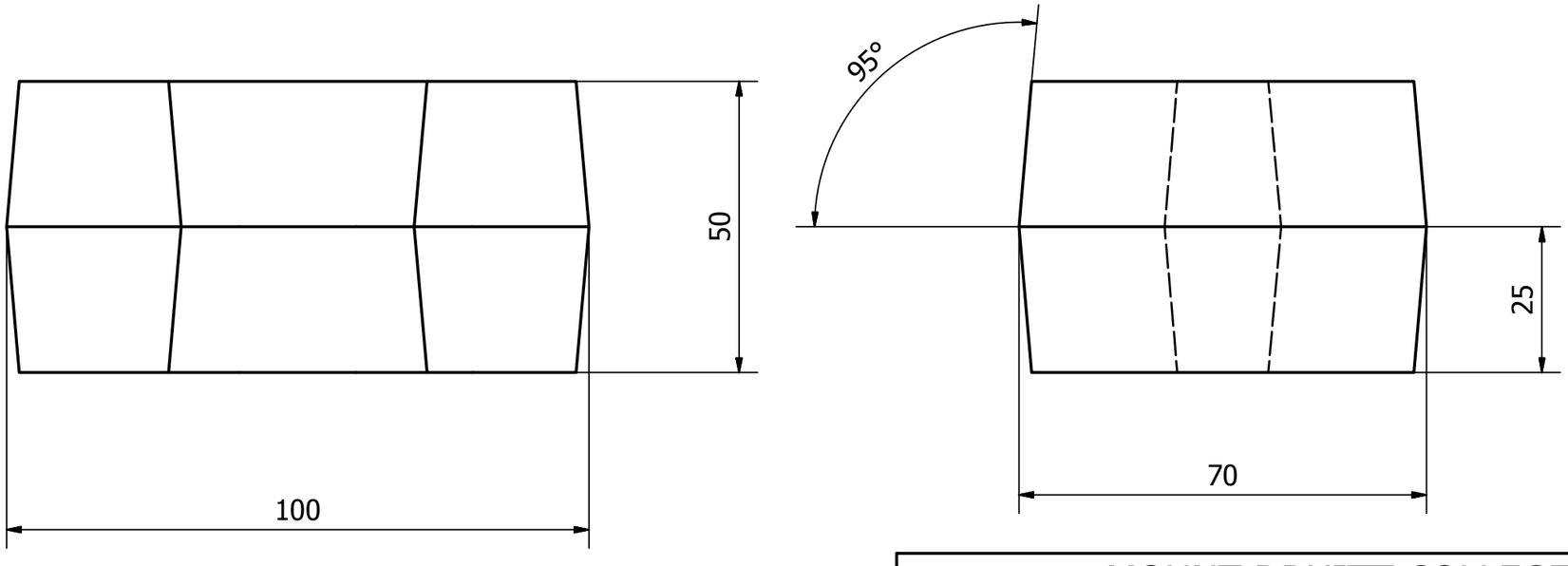
DETAIL DRAFTING



DRAWN MCS	BEVELLED BLOCK		
CHECKED			
DATE AUG 2015	SCALE 1:1	DRAWING NO IF_EXTRUDE_2	







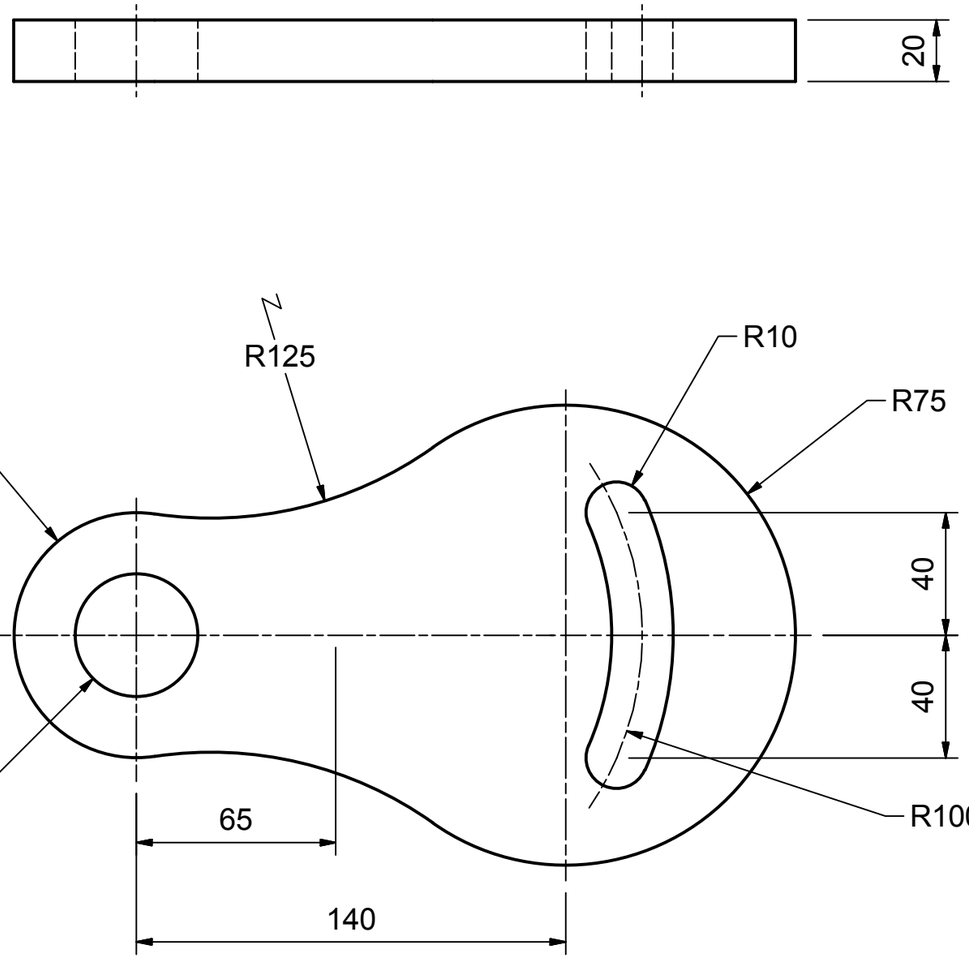
HINT

Draw the "I" shaped profile with fillets then extrude in both directions with 5 degree taper. (Lesson 3)

MOUNT DRUITT COLLEGE OF TAFE

DETAIL DRAFTING

	DRAWN MCS	I BLOCK	
	CHECKED		
	DATE AUG 2015	SCALE 1:1	DRAWING NO IF_EXTRUDE_3



HINT

Draw the profile and extrude 20mm.

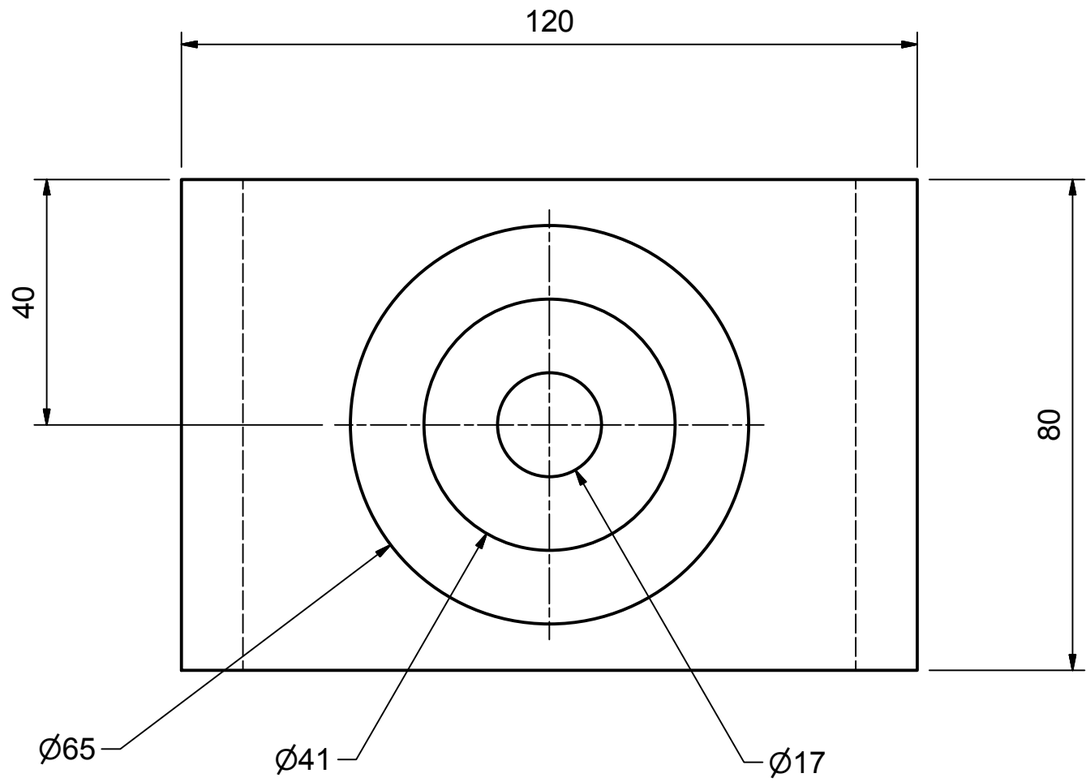
Make sure sketch is fully constrained.

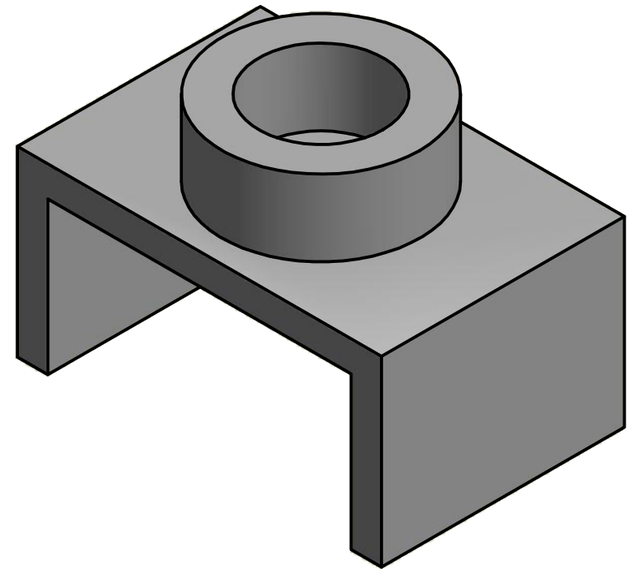
(Lesson 3)

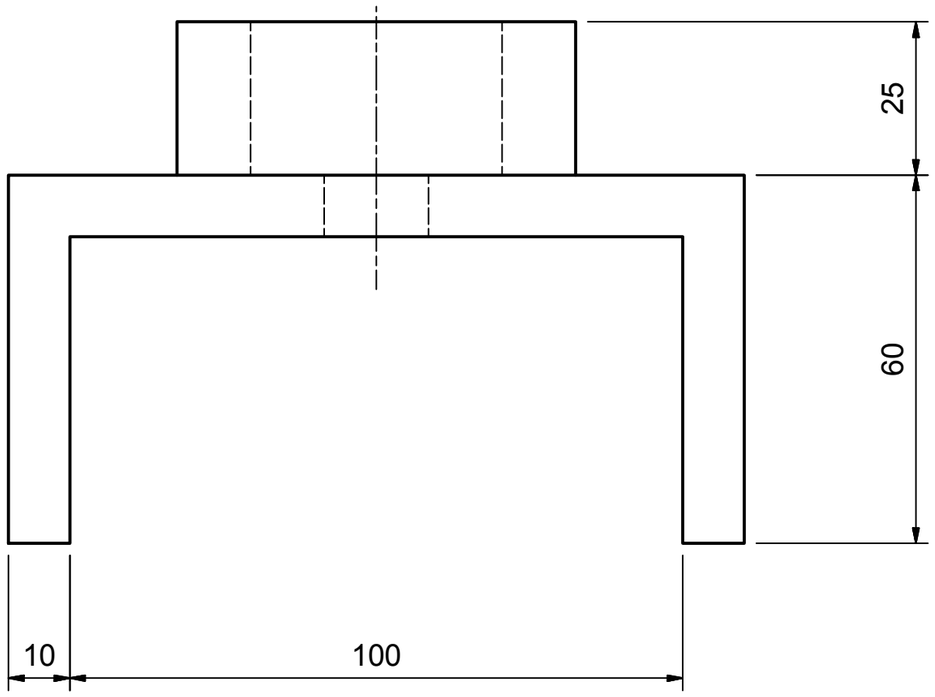
MOUNT DRUITT COLLEGE OF TAFE

DETAIL DRAFTING

DRAWN MCS	TITLE SWIVEL PLATE		
CHECKED			
DATE AUG 2015	SCALE 1:2	DRG. NO. IF_EXTRUDE_4	





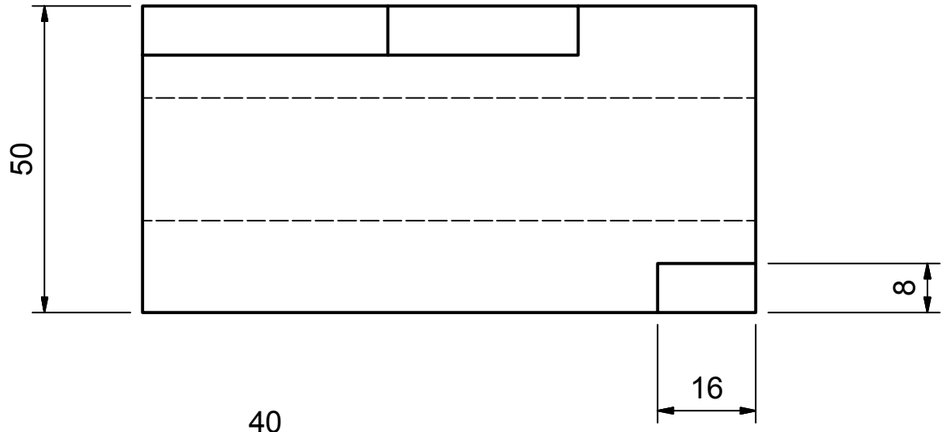


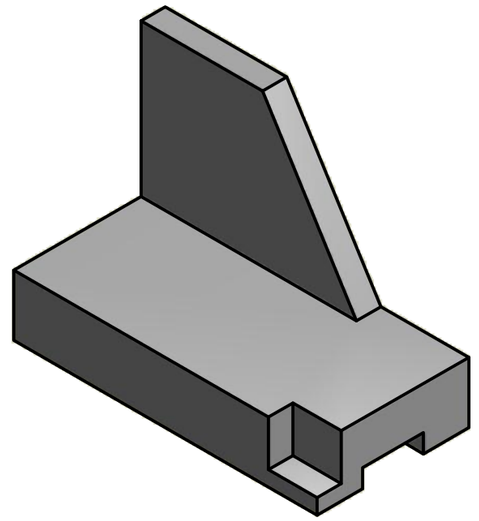
HINT

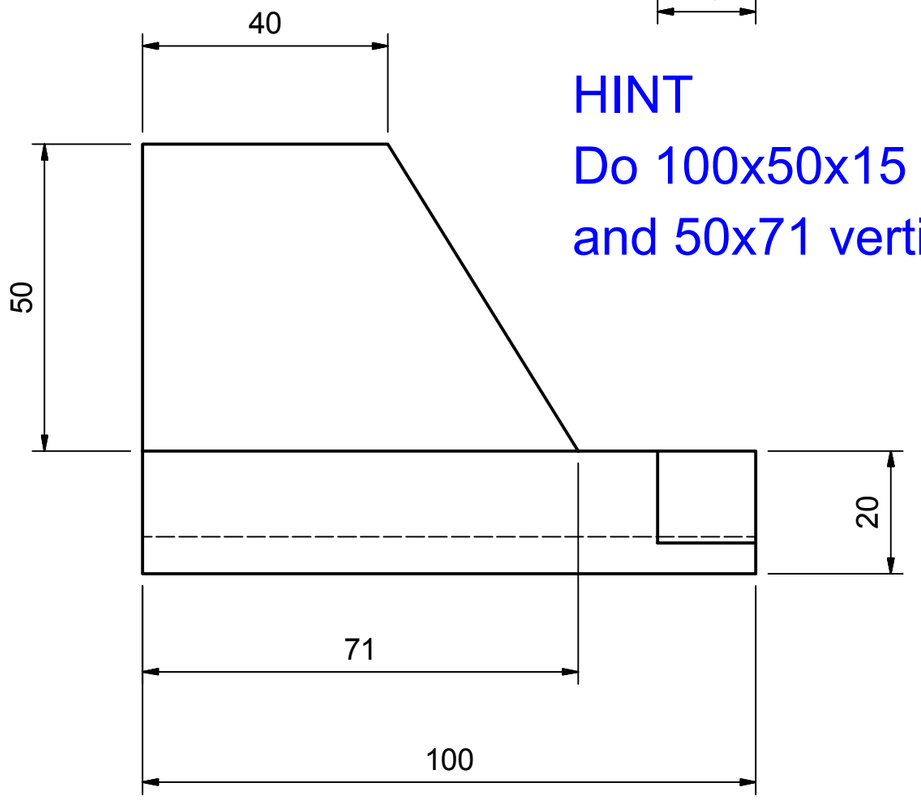
This can be done multiple ways, but mostly start with the rectangular section. (Lesson 3)

MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

	DRAWN MCS	TITLE BEARING BRACKET	
	CHECKED		
	DATE AUG 2015	SCALE 1:1	DRG. NO. IF_EXTRUDE_5

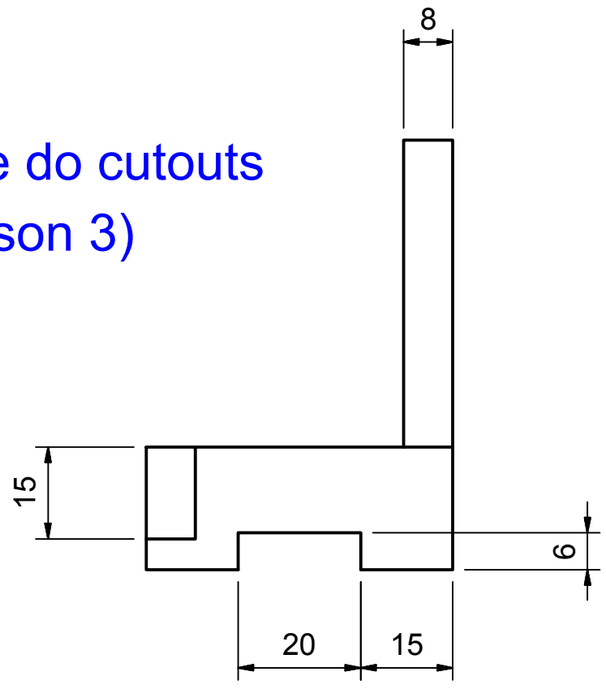






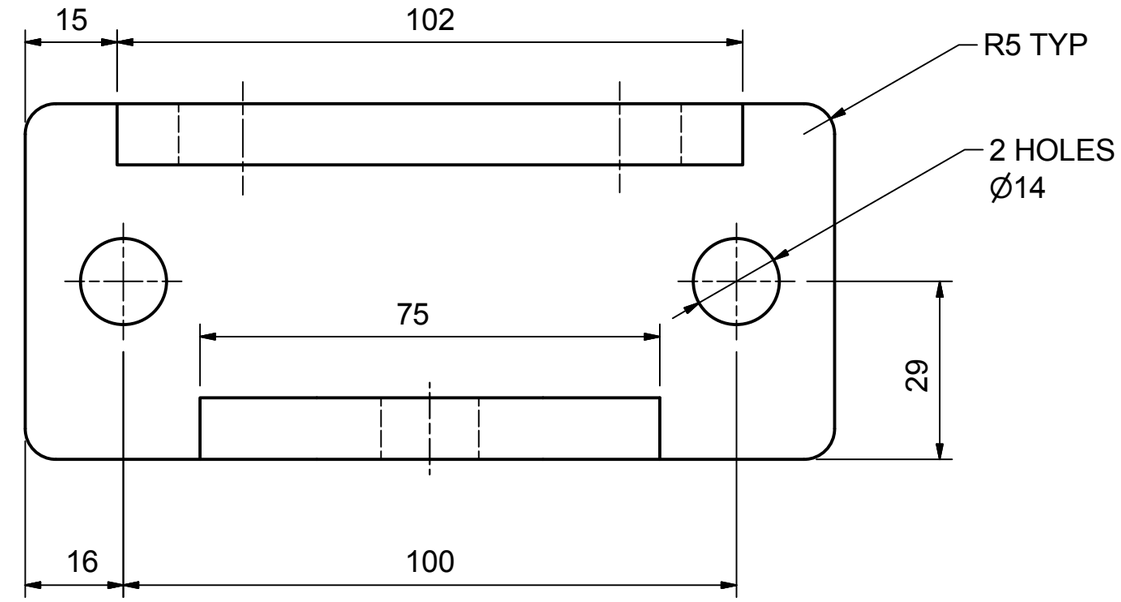
HINT

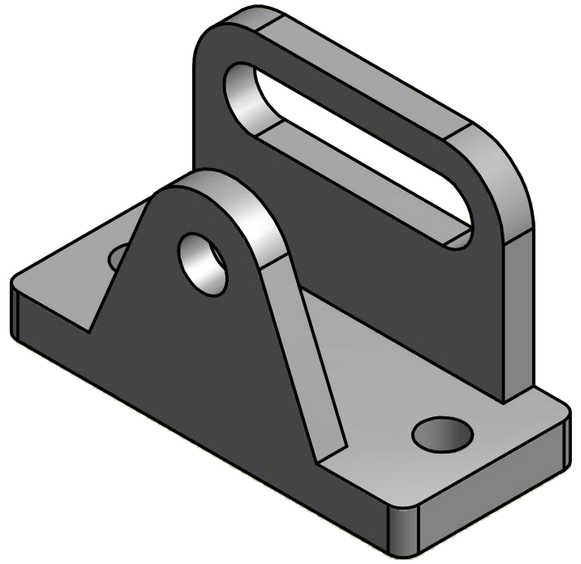
Do 100x50x15 base block, the do cutouts and 50x71 vertical plate. (Lesson 3)

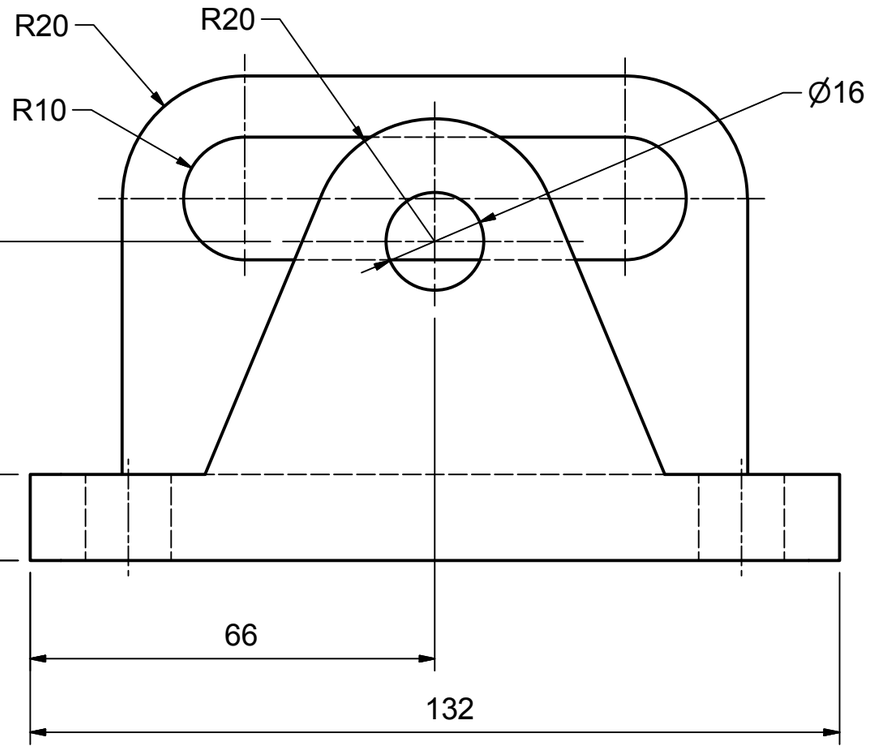


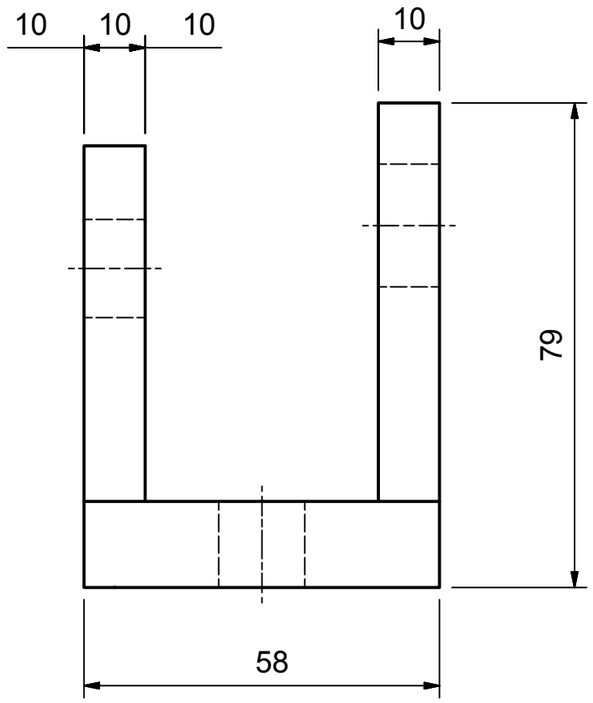
MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

	DRAWN MCS	TITLE ANGLE BRACKET	
	CHECKED		
	DATE AUG 2015	SCALE 1:1	DRG. NO. IF_EXTRUDE_6









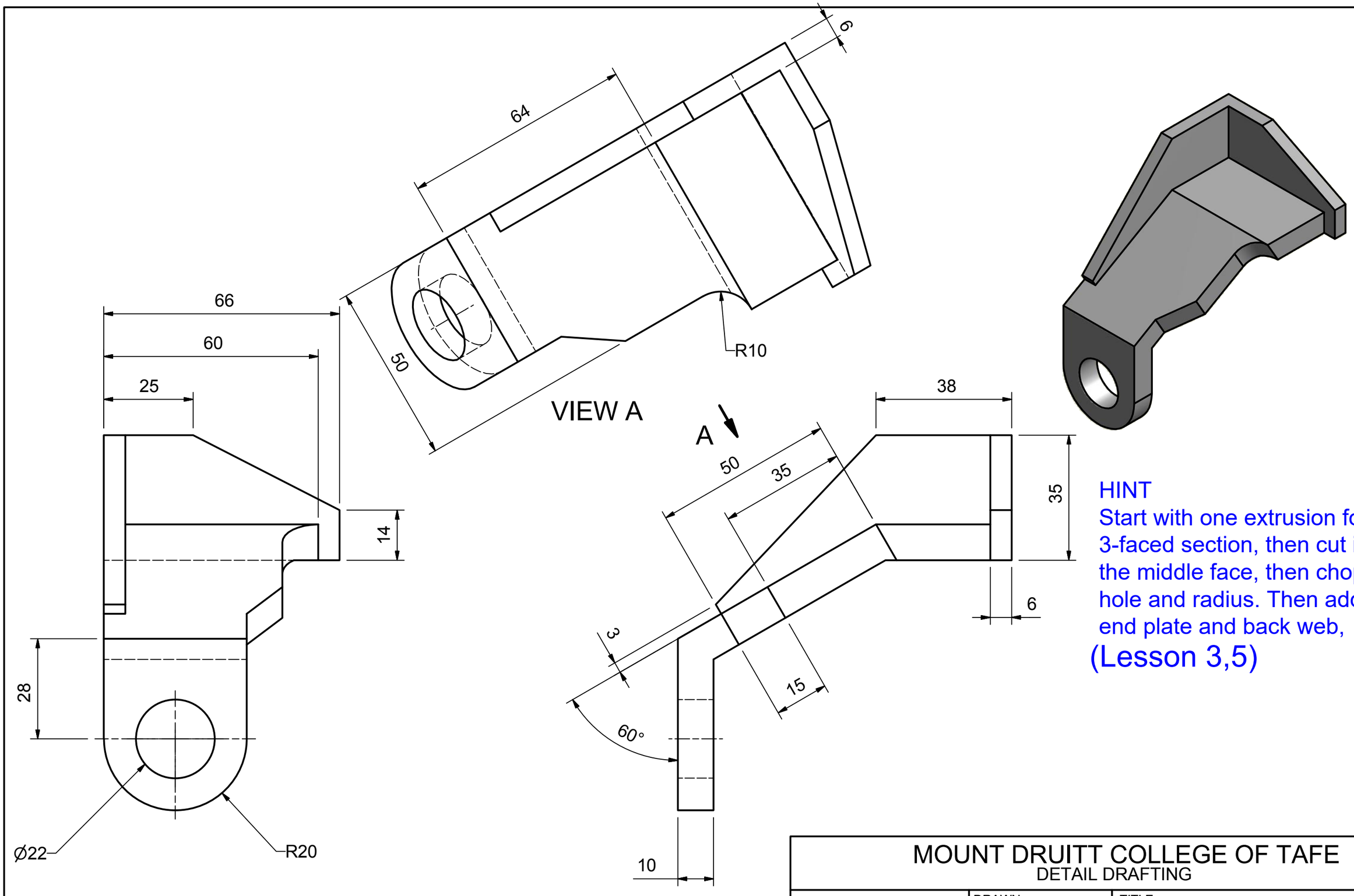
HINT

Start with 132x58x14 base plate, then add the rest.

(Lesson 3,5)

MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

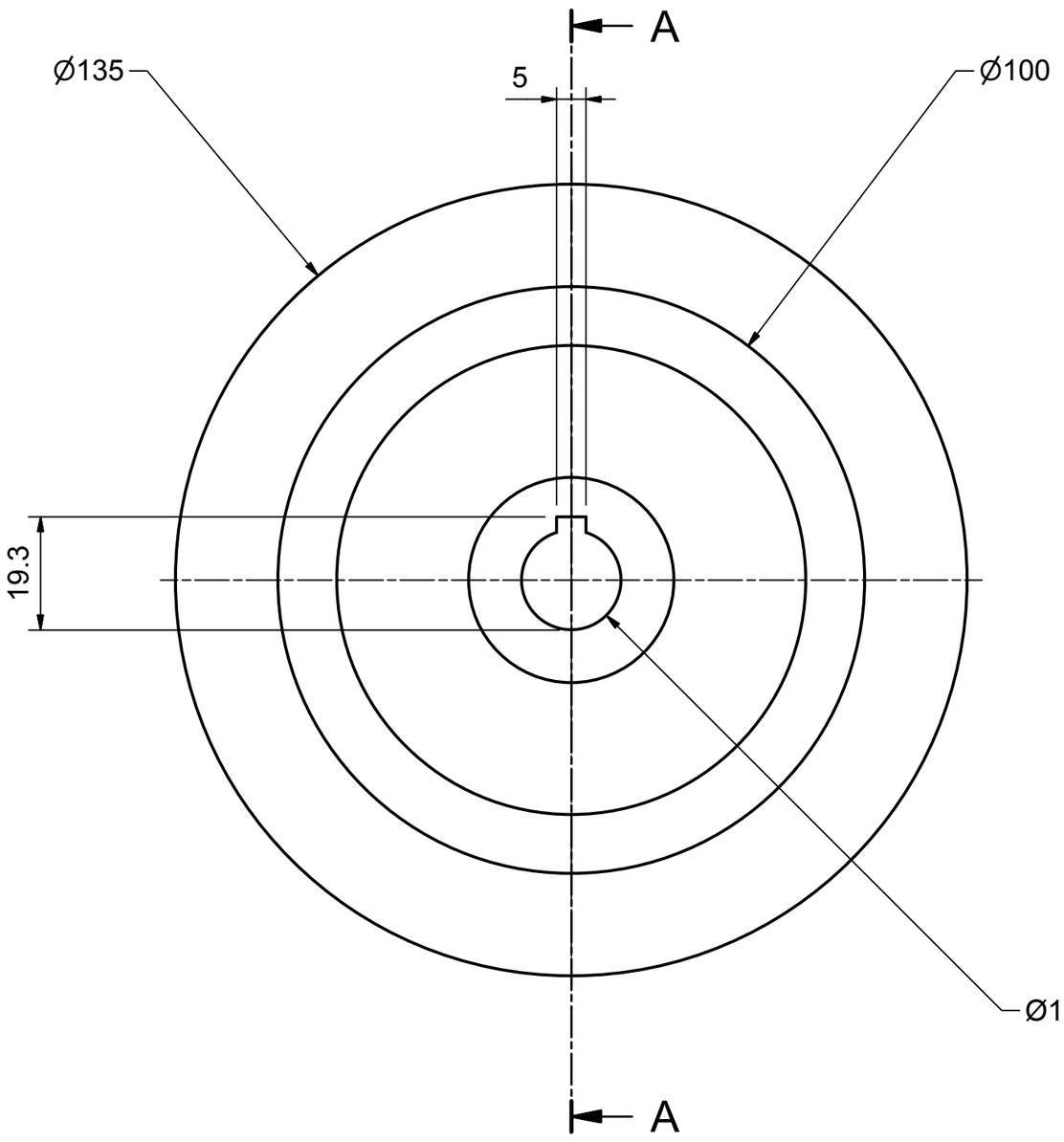
DRAWN MCS	TITLE MOUNTING BLOCK		
CHECKED			
DATE AUG 2015	SCALE 1:1	DRAWING No. IF_EXTRUDE_7	

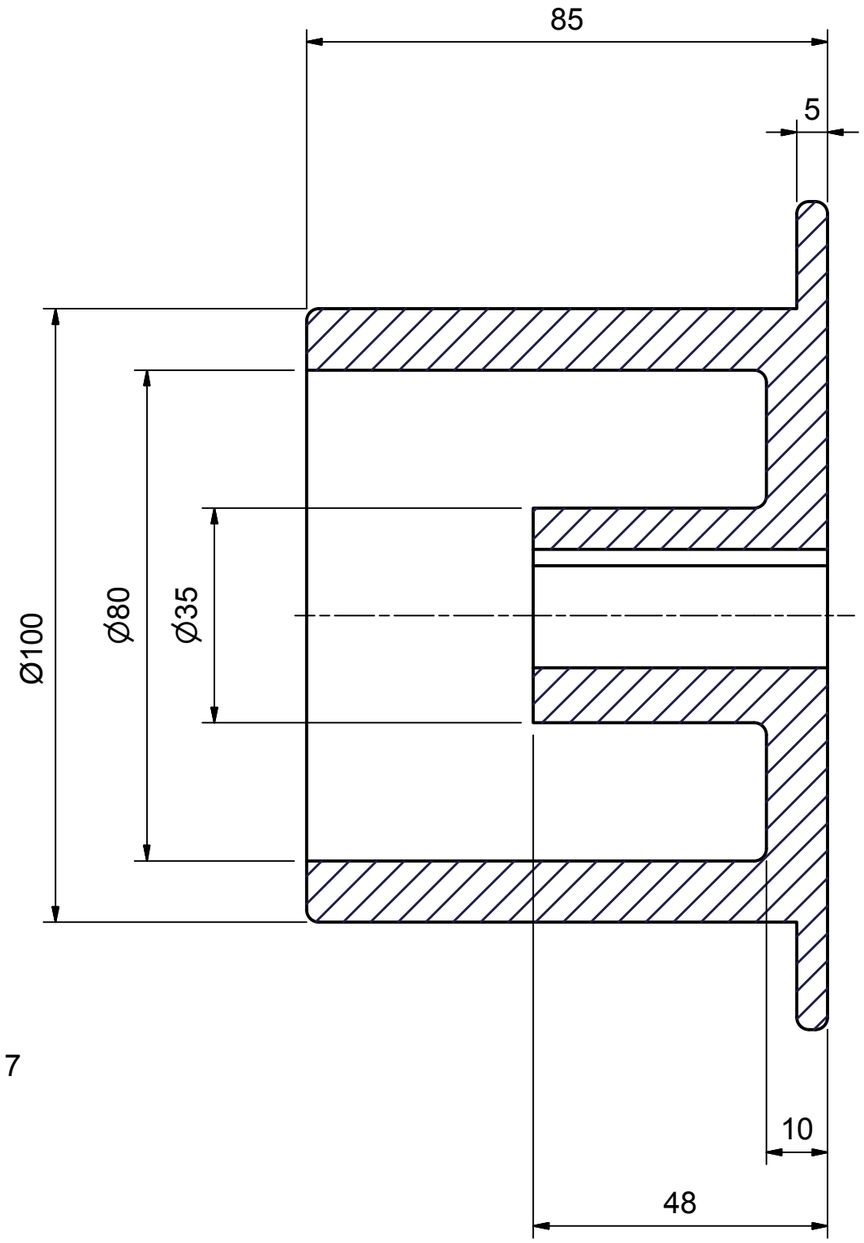


HINT
Start with one extrusion for the 3-faced section, then cut it from the middle face, then chope the hole and radius. Then add the end plate and back web,
(Lesson 3,5)

MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

DRAWN MCS	TITLE BRACKET		
CHECKED			
DATE AUG 2015	SCALE 1:1	DRAWING No. IF_EXTRUDE_8	





SECTION A-A

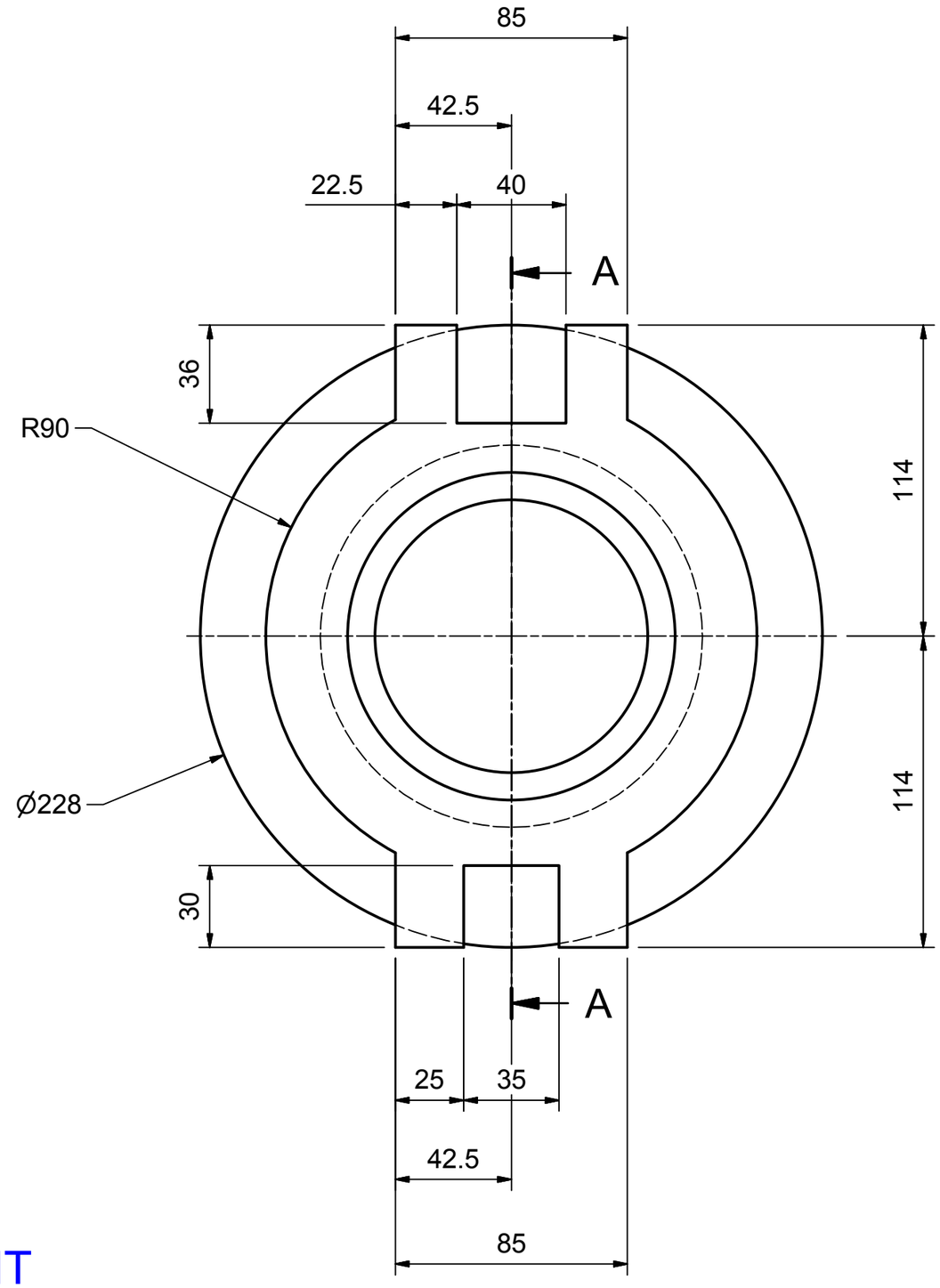
ALL FILLETS TO BE R2 UNO

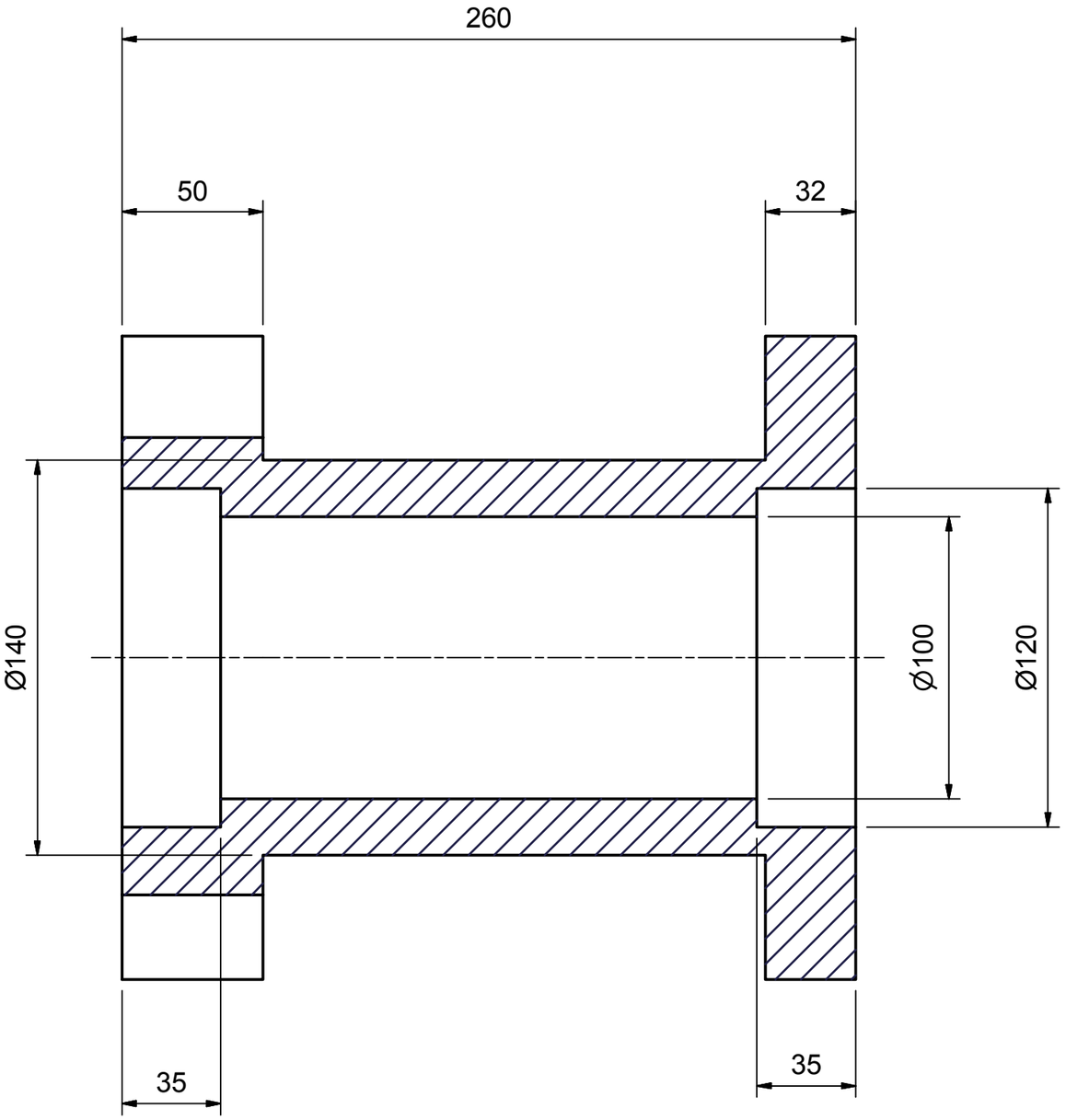
HINT

Do revolved feature then cut out the keyway (Lesson 4)

MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

DRAWN MCS	TITLE PULLEY		
CHECKED			
DATE AUG 2015	SCALE 1:1	DRG. NO. IF_REVOLVE_1	





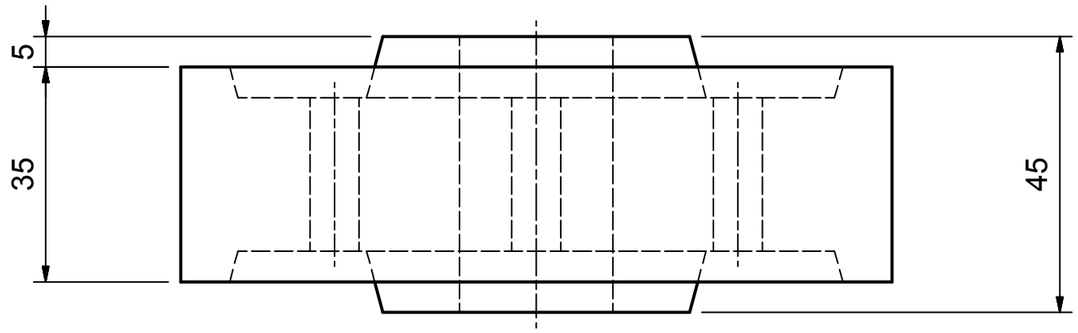
SECTION A-A

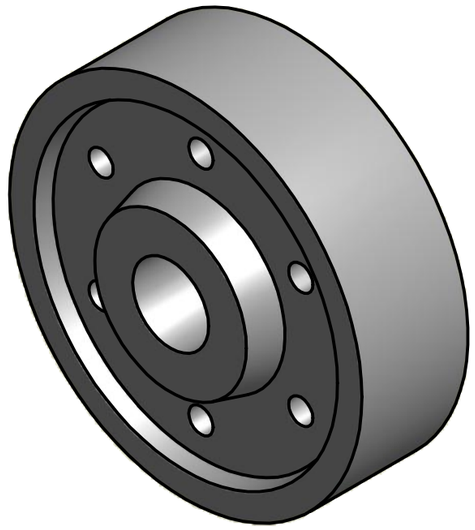
HINT

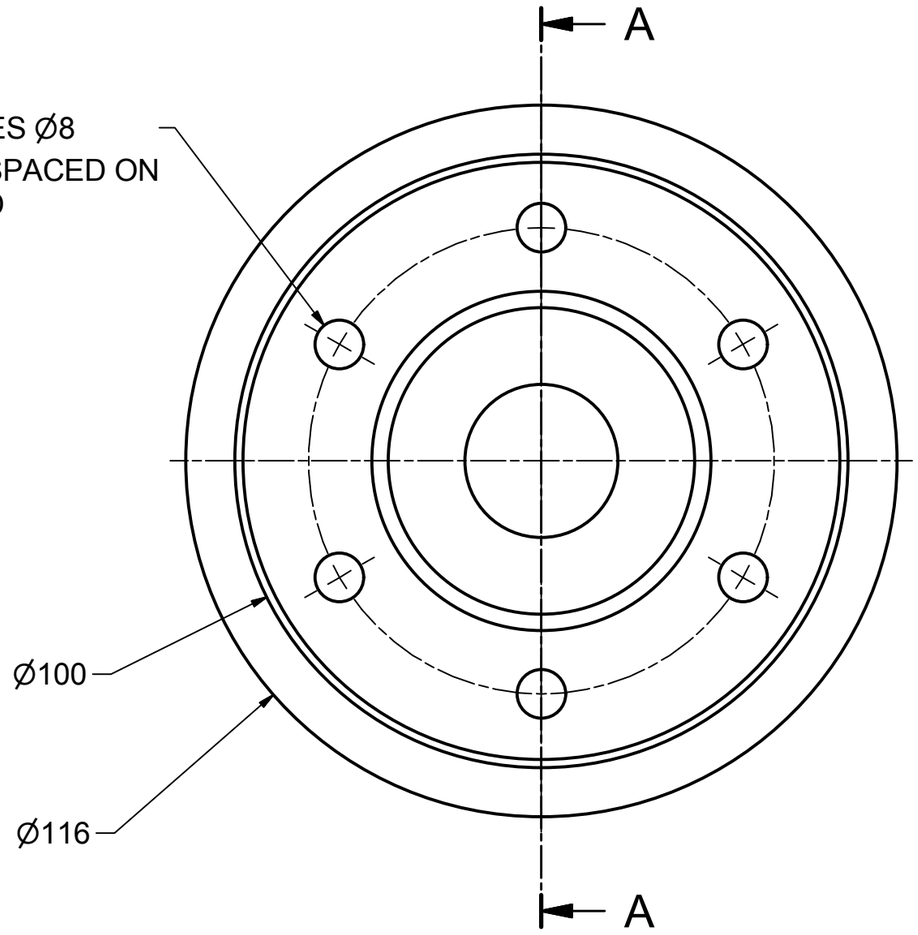
Revolve > Add 85 wide solid lugs to 114mm, then cut out the 35x30 slots. (Lesson 4)

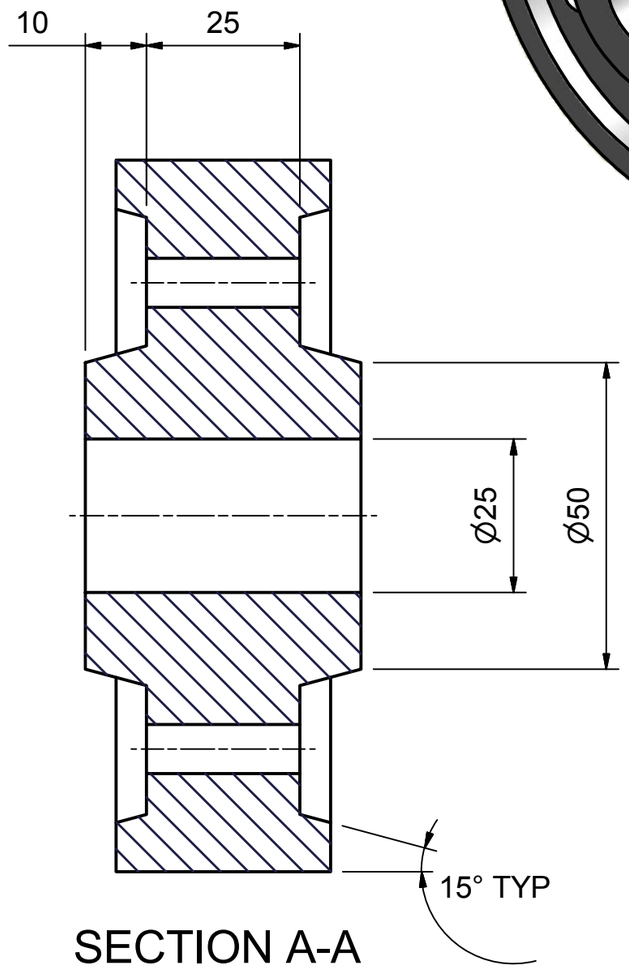
MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

	DRAWN MCS	TITLE VALVE BODY	
	CHECKED		
	DATE AUG 2015	SCALE 1:2	DRG. NO. IF_REVOLVE_2







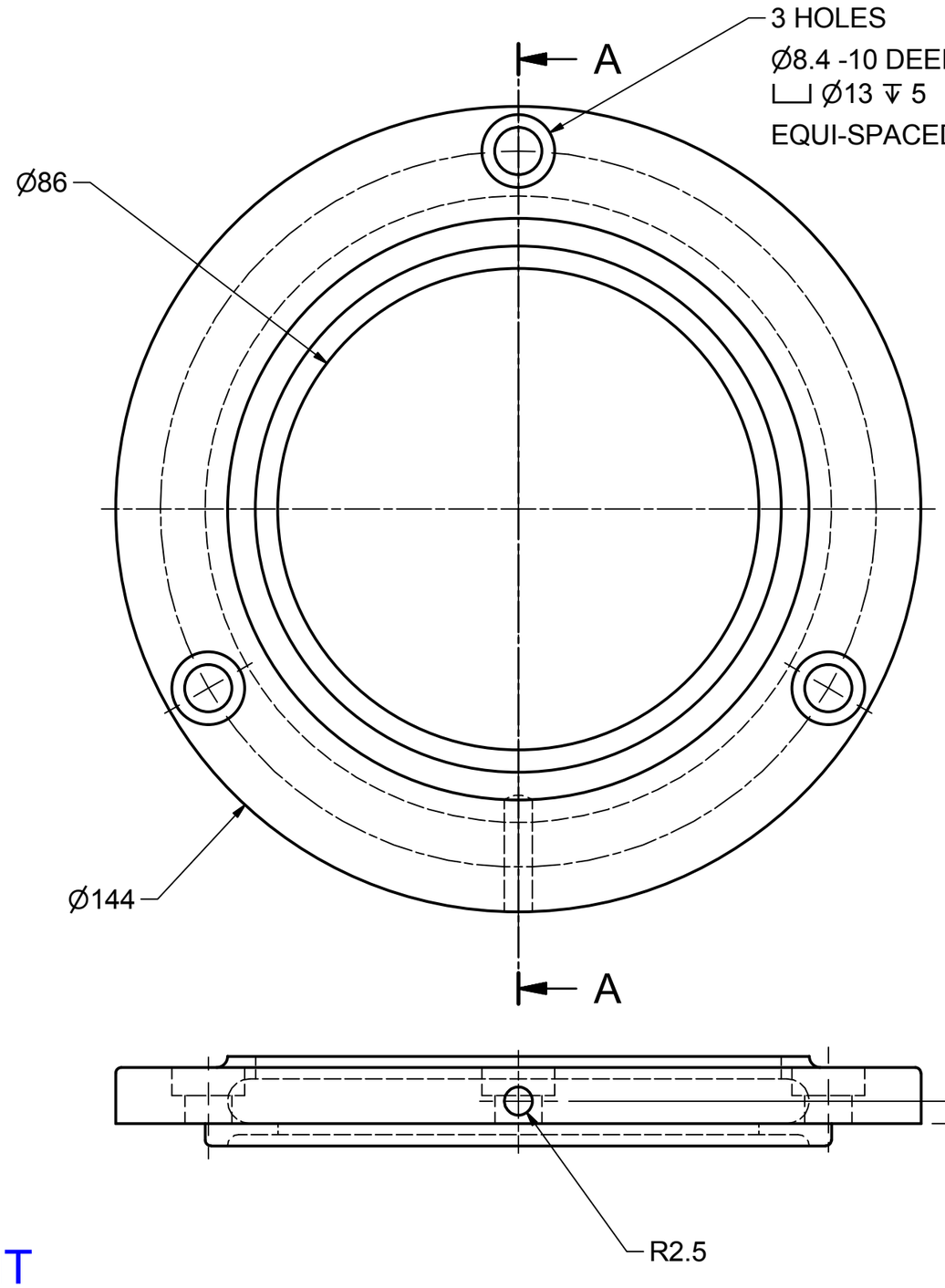


SECTION A-A

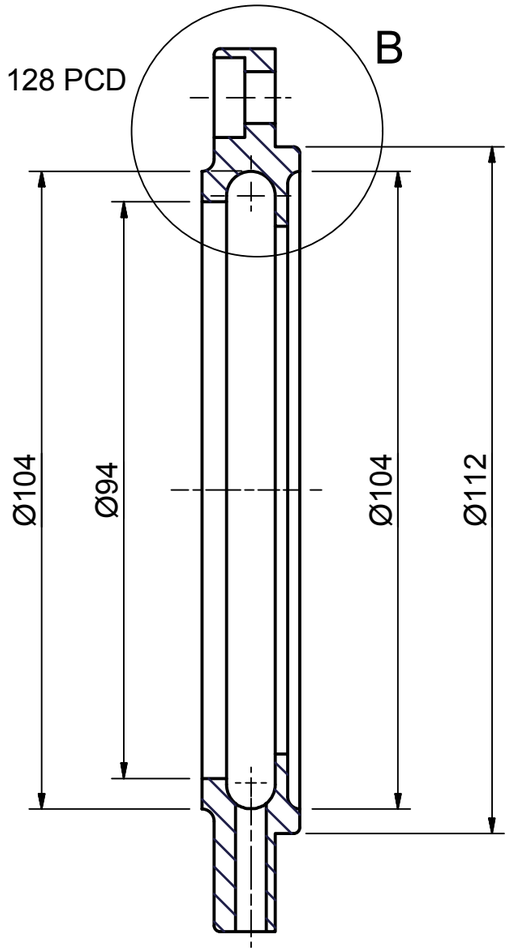
HINT

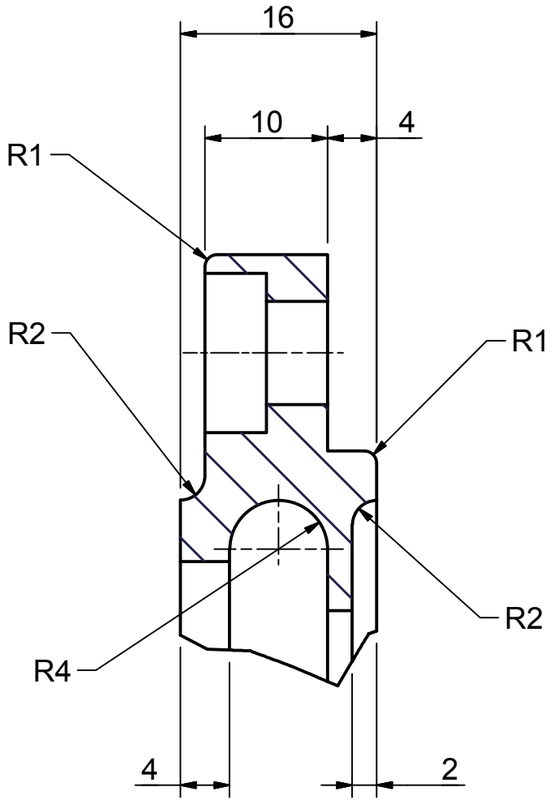
Revolve the wheel and then drill one hole, then pattern the hole to make 6 of them (Lesson 4, 8.5)

MOUNT DRUITT COLLEGE OF TAFE DETAIL DRAFTING			
	DRAWN MCS	TITLE GUIDE ROLLER	
	CHECKED		
	DATE AUG 2015	SCALE 1:1	DRG. NO. IF_REVOLVE_3



SECTION A-A





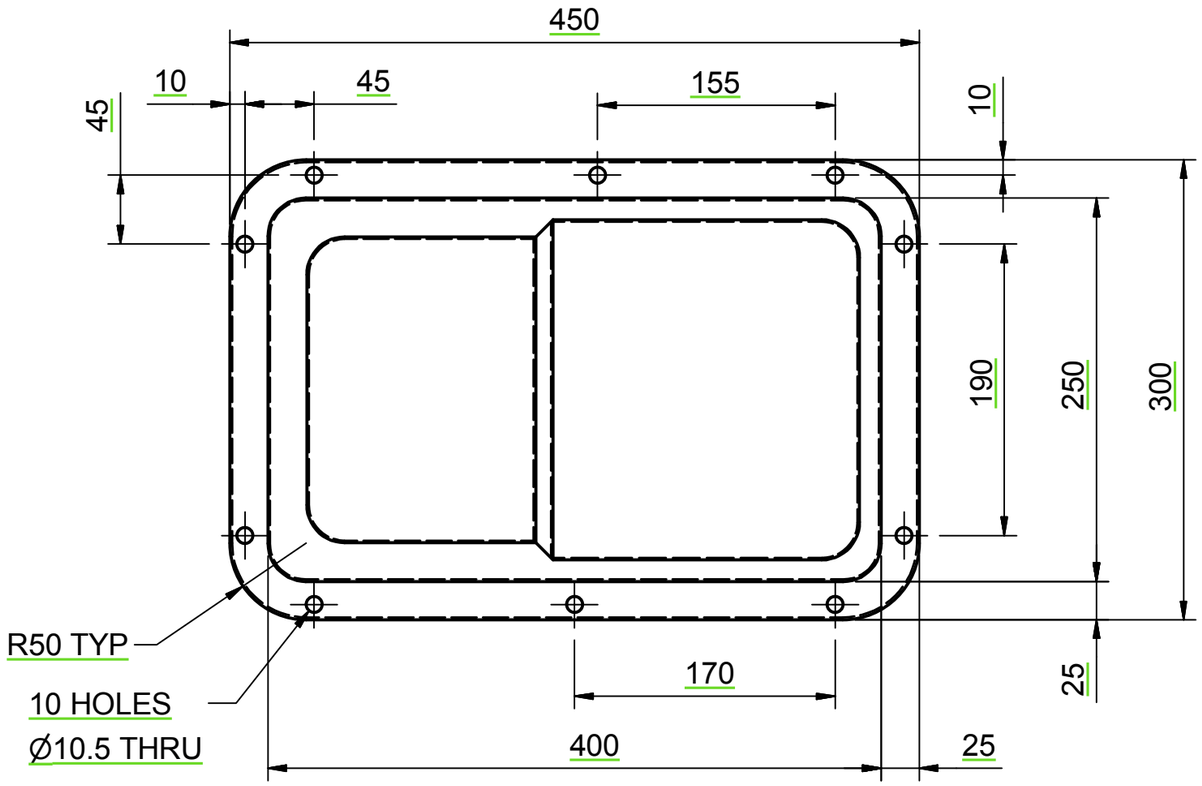
DETAIL B
SCALE 2 : 1

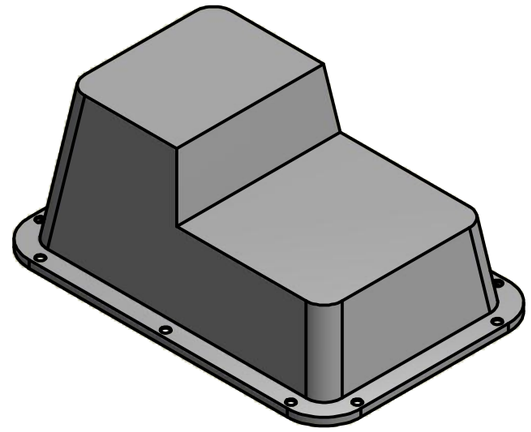
HINT

Revolve the main shape then add PCD holes (better to use 3D pattern after making a countersunk hole, then add R2.5 hole (Lesson 4, 8.5)

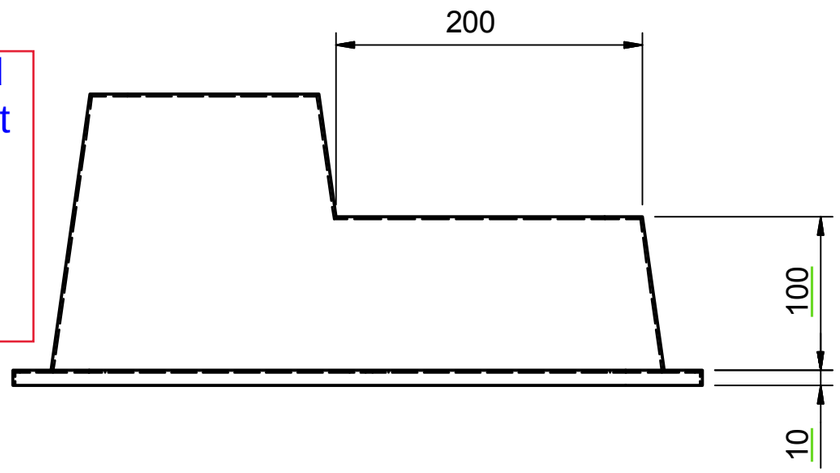
MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

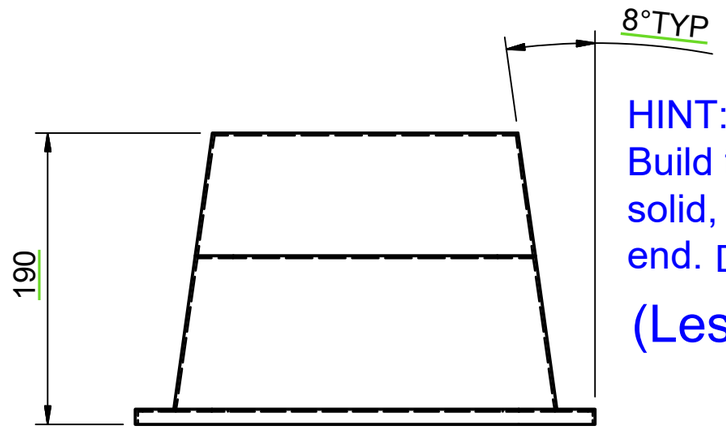
DRAWN MCS	TITLE BEARING RETAINER		
CHECKED			
DATE AUG 2015	SCALE 1:1 , 2:1	DRG. NO. IF_REVOLVE_4	





Note: This is a pressed sheet metal component so everything is the same thickness. There is no thickened flange for the bolt holes.



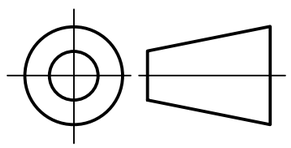


HINT:
Build the entire thing solid, then shell at the end. Drill holes last

(Lesson 11)

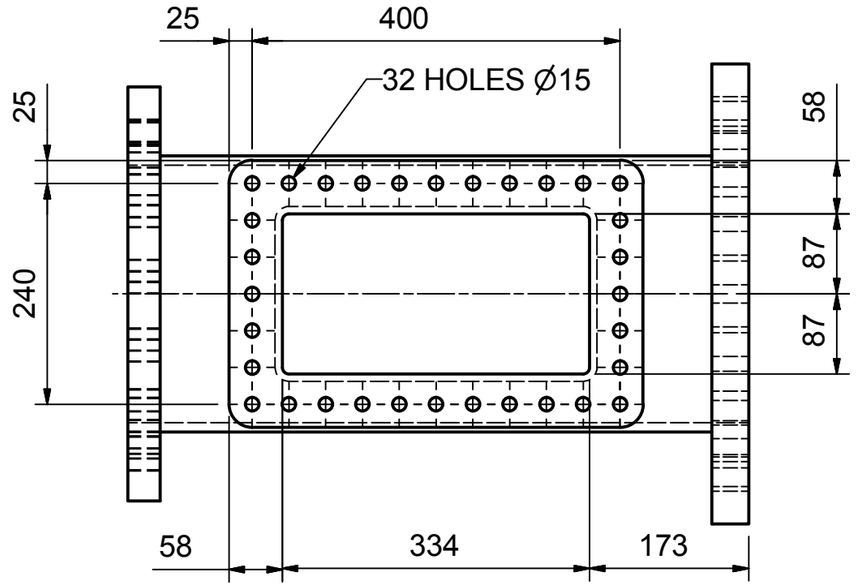
MATERIAL : 1.6mm MILD STEEL
APPLY A FILLET OF 25 TO FOUR CORNERS
APPLY A FILLET OF 6 TO ALL OTHER CORNERS
EXCEPT THE OUTSIDE EDGE WHICH WILL BE 2mm

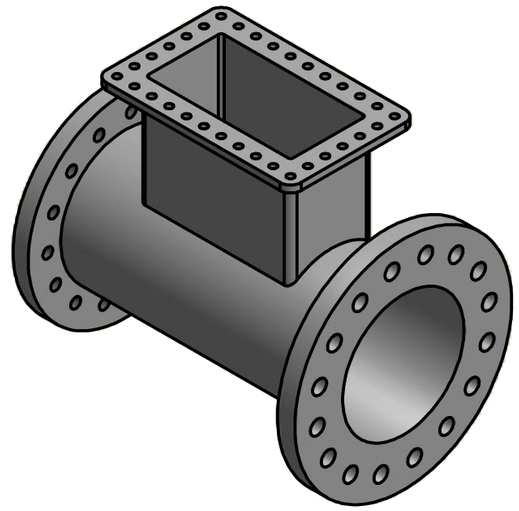
MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

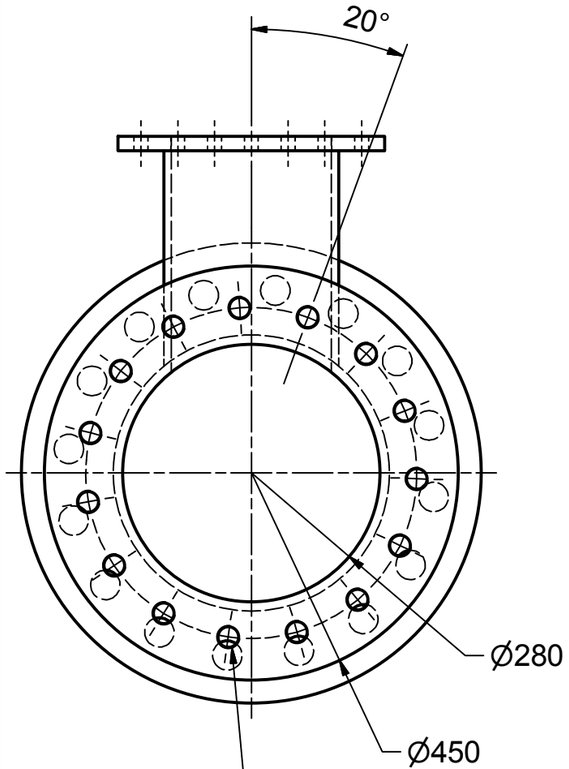


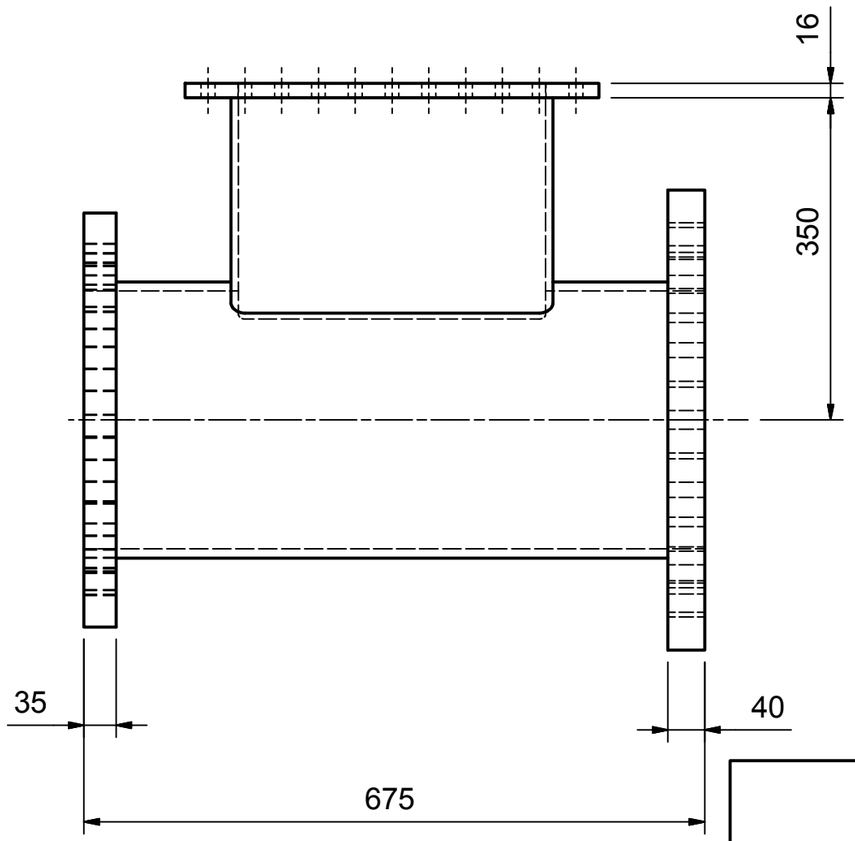
DRAWN P.S.	TITLE ENGINE SUMP		
CHECKED			
DATE 18:08:03	SCALE 1:2.5	DRG. NO. INV_SH01	

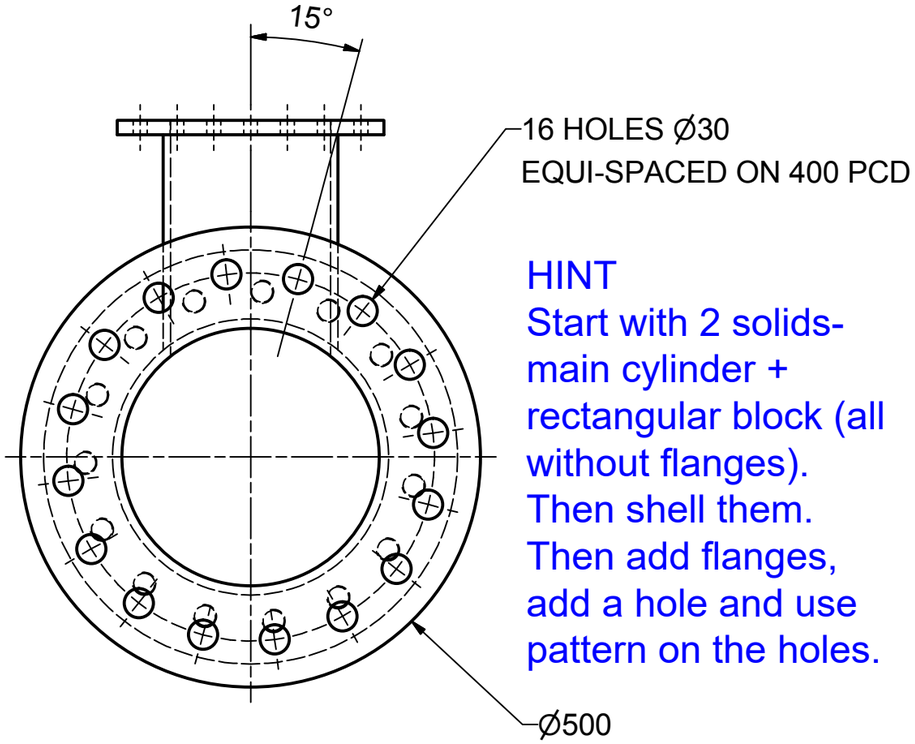
NOTE! ANY DIMENSIONS NOT SHOWN ARE AT THE DESCRETION OF THE STUDENT











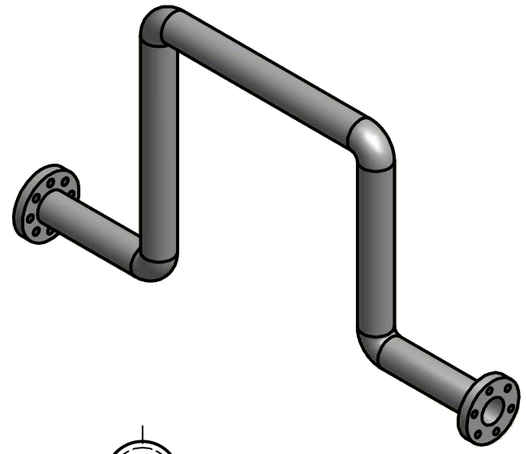
HINT
Start with 2 solids- main cylinder + rectangular block (all without flanges). Then shell them. Then add flanges, add a hole and use pattern on the holes.

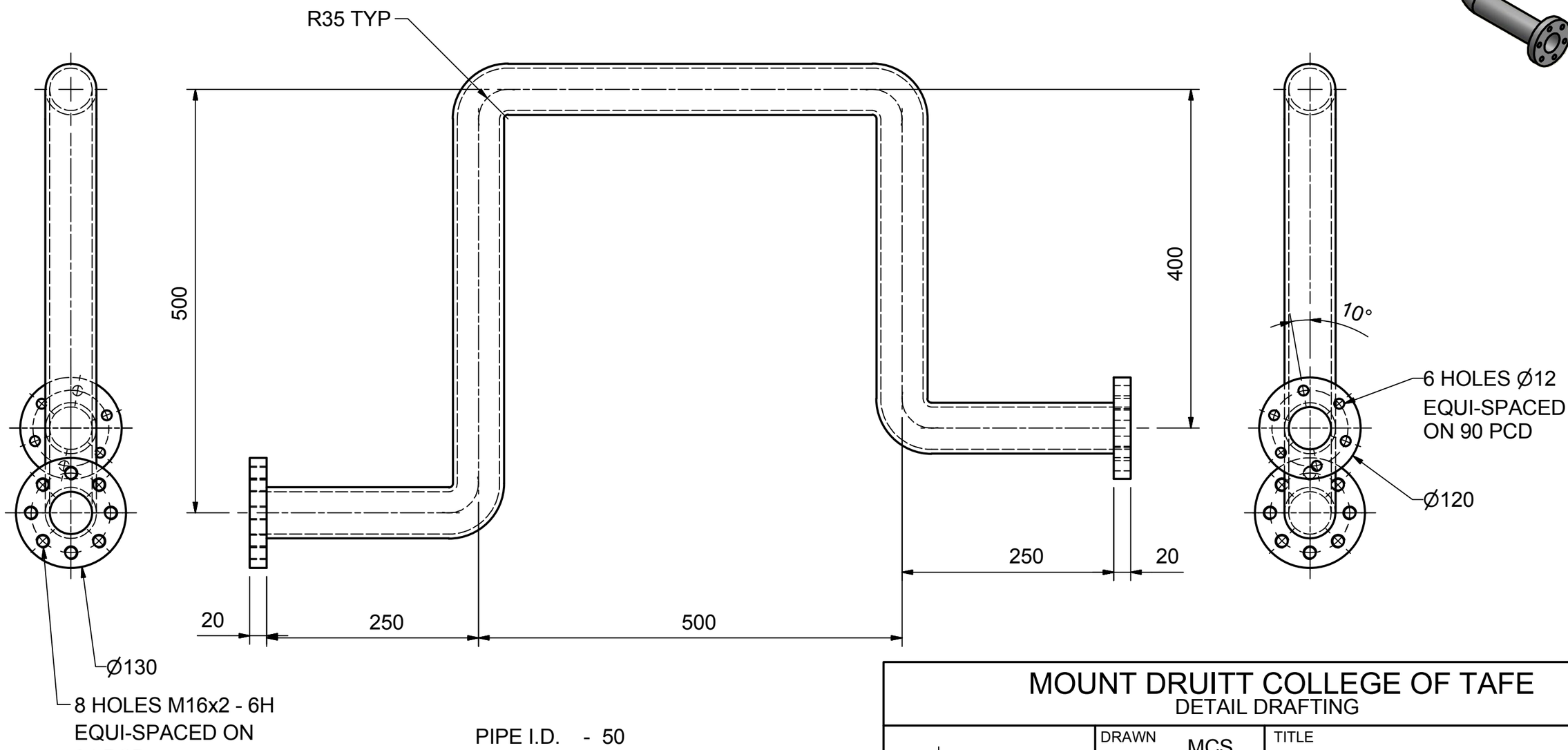
(Lesson 11, 8.5)

MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

DRAWN MCS	TITLE TEE JUNCTION		
CHECKED			
DATE Sept 2014	SCALE NTS	DRAWING No. IF_SHELL_2	

HINT:
Recommend to do the pipe first as a solid, then shell it, then add the flanges on each end. You cannot use shell if the flanges are already attached. (Lesson 10, 8.5)

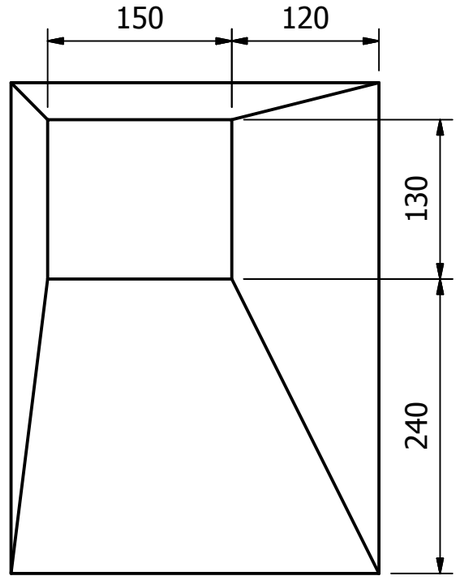


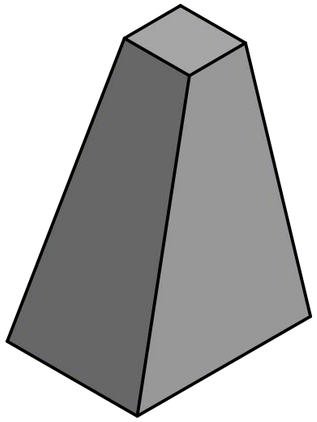


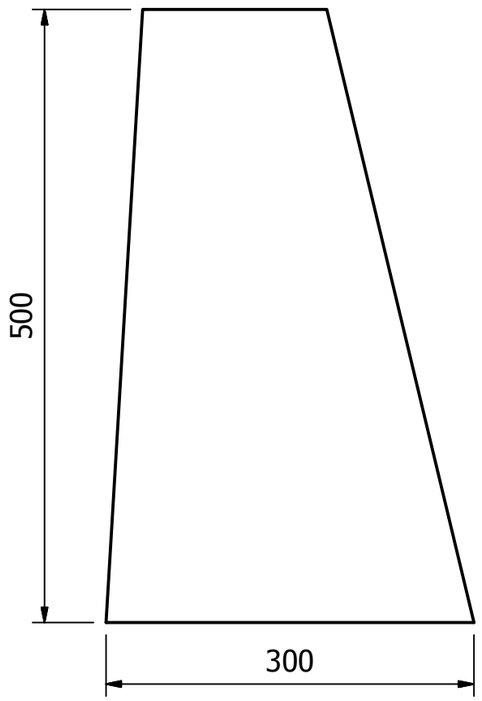
PIPE I.D. - 50
PIPE O.D. - 60.3

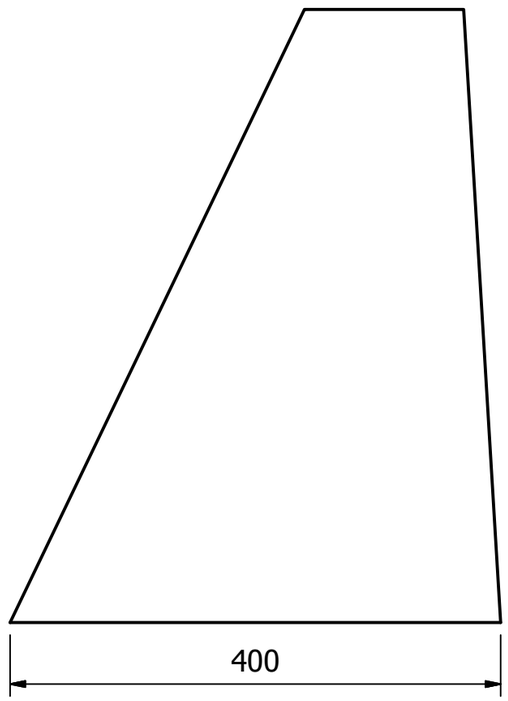
MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

DRAWN MCS	TITLE PIPE SPOOL		
CHECKED			
DATE March 2014	SCALE NTS	DRAWING No. Sweep_1	







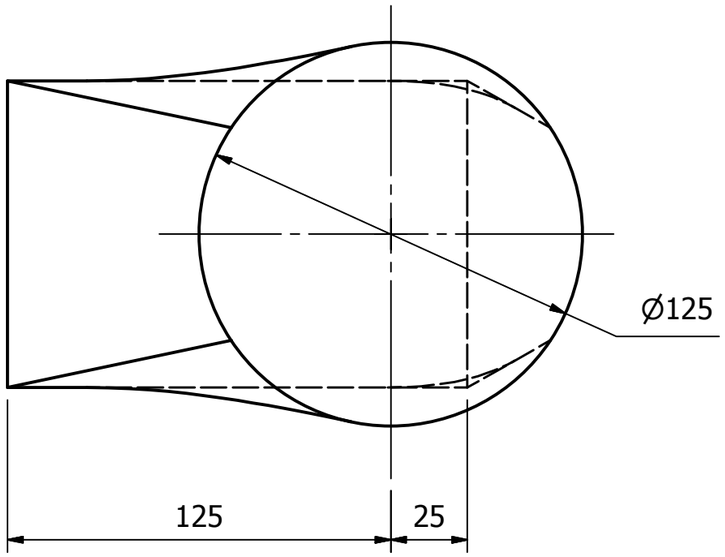


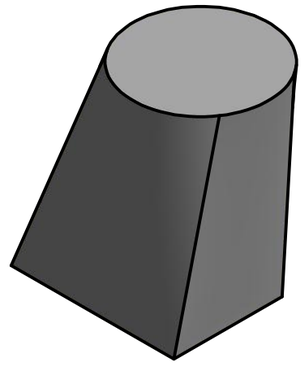
(Lesson 9)

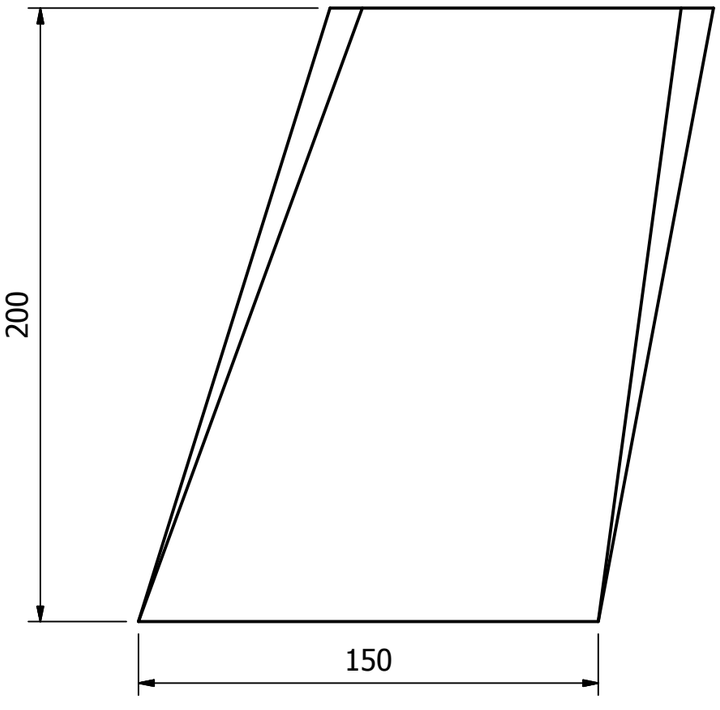
W.S.I. TAFE Mount Druitt

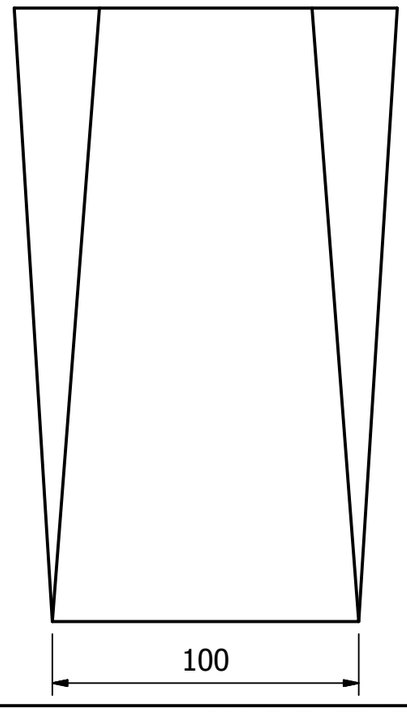
Engineering Drafting

	Drawn: MCS	Title: Simple Loft	
	Checked:		
	Date: March 2014	Scale: 1:5	Drawing Number: Loft_1







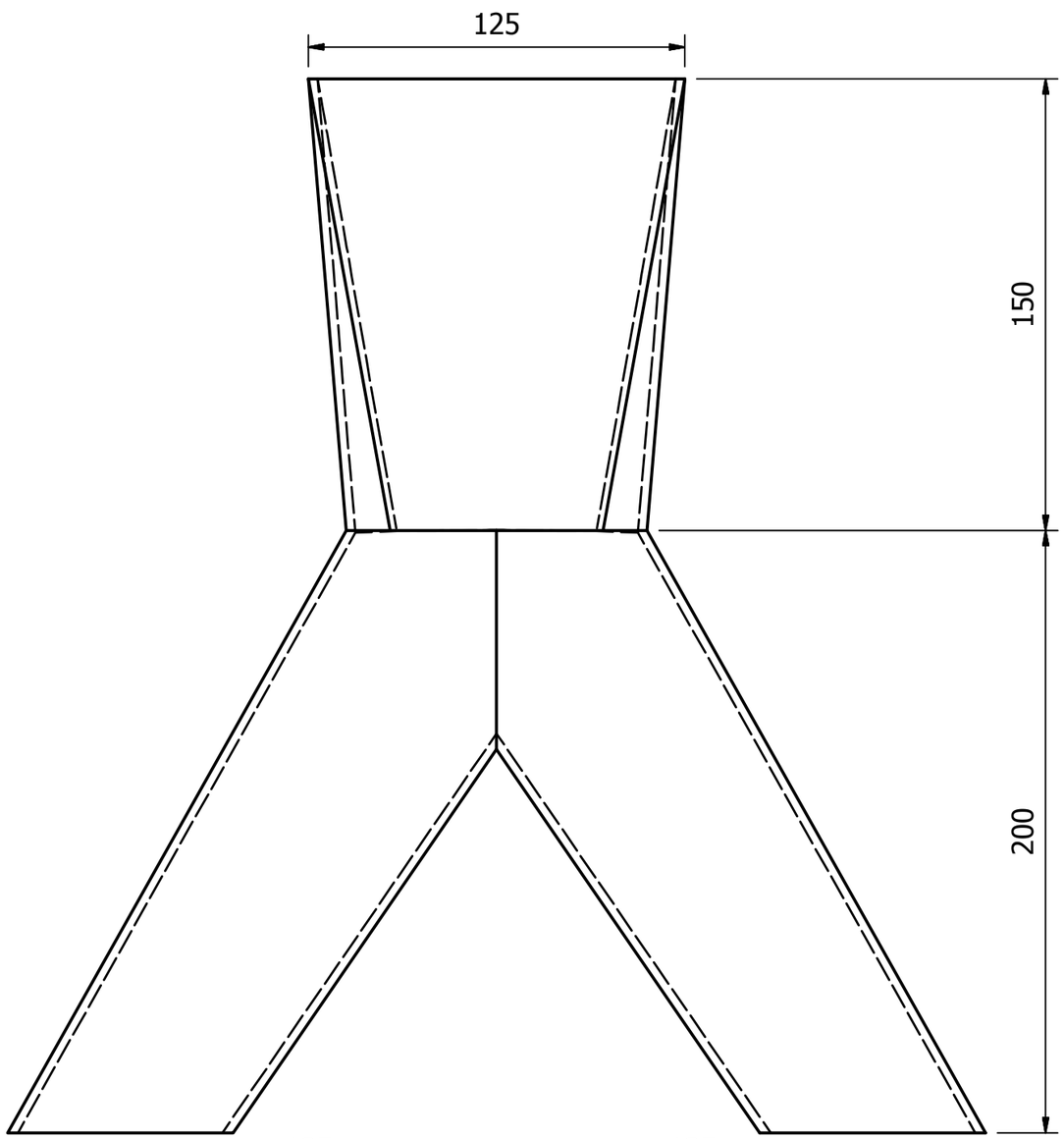


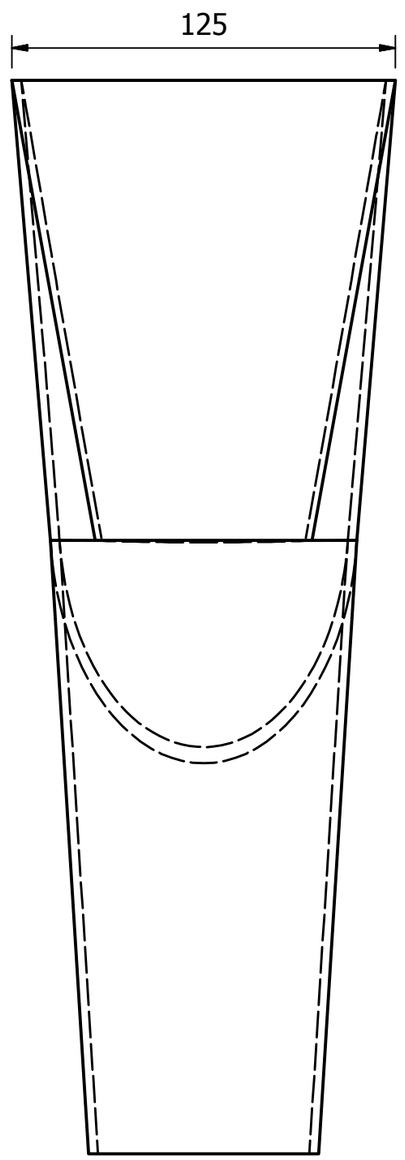
(Lesson 9)

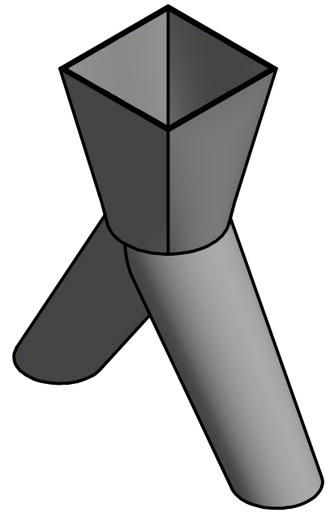
W.S.I. TAFE Mount Druitt

Engineering Drafting

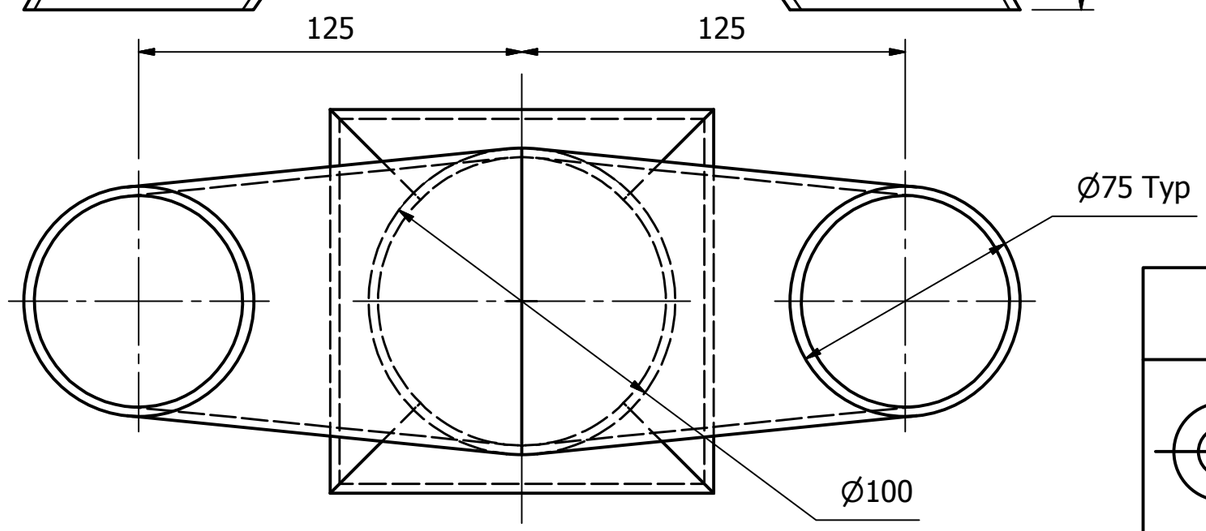
	Drawn: MCS	Title: Square to Round Transition	
	Checked:		
	Date: March 2014	Scale: 1:2	Drawing Number: Loft_2







HINT:
Create legs and body in separate solid lofts, then shell the whole thing at the end.
(Lesson 9, 11)



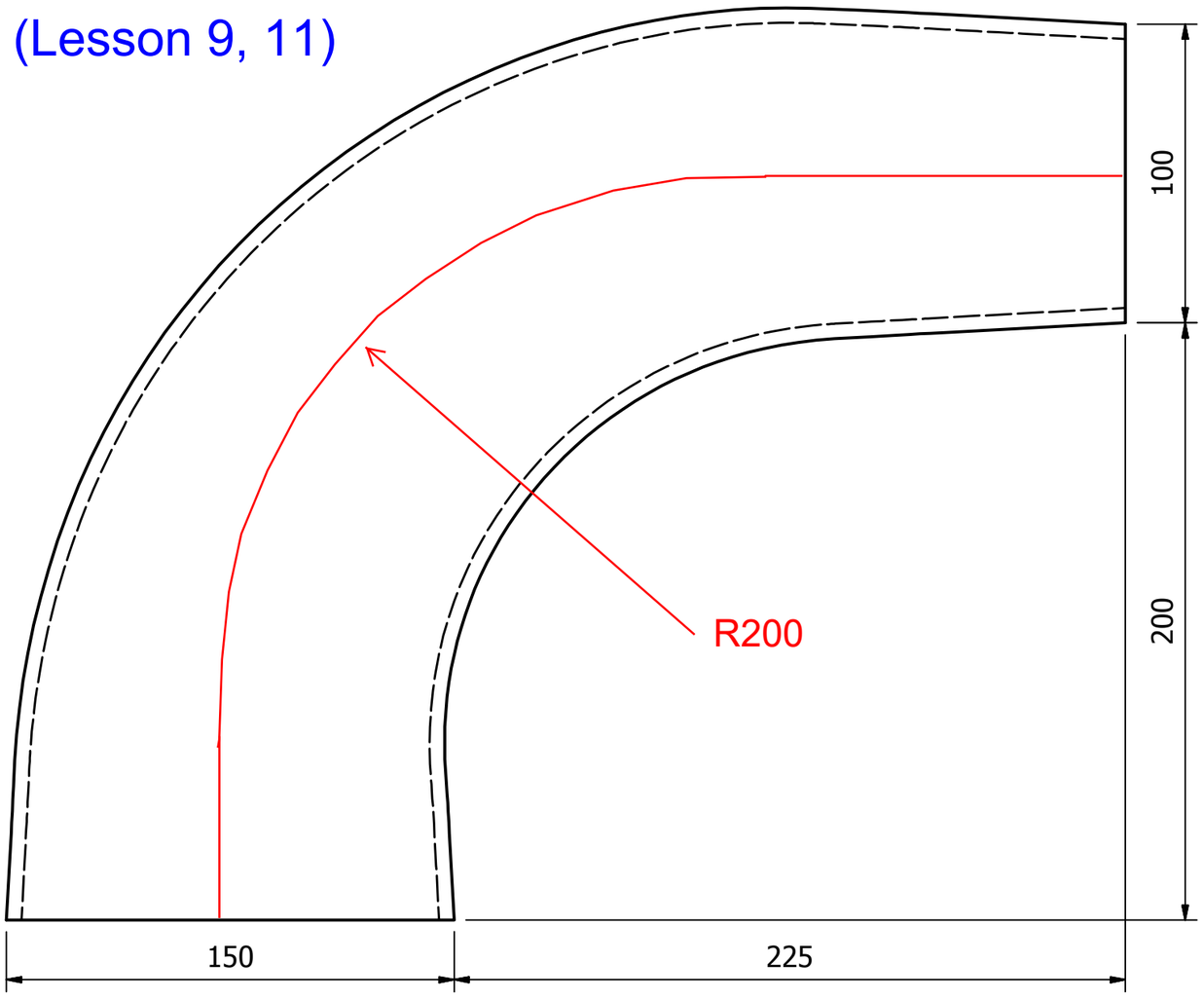
Note:
Wall thickness to be 3mm.
All dimensions to outside surfaces unless specified otherwise.

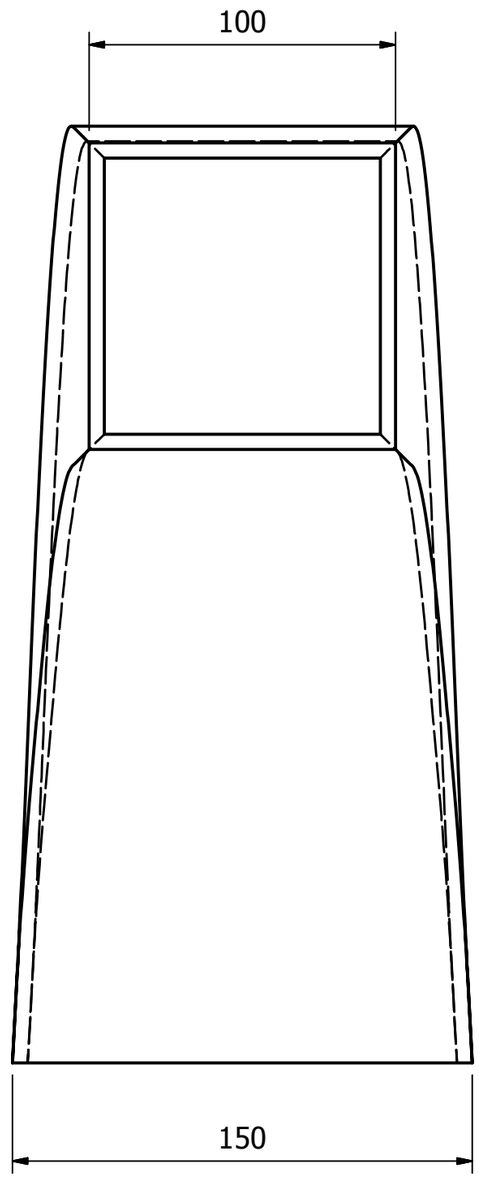
W.S.I. TAFE Mount Druitt
Engineering Drafting

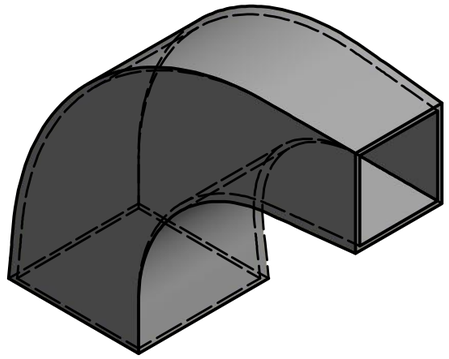
	Drawn: MCS	Title: Hopper Feed	
	Checked:		
	Date: March 2014	Scale: 1:2	Drawing Number: Loft_3

HINT:
Create a centreline rail. Use a radius 200mm on the centreline with straight lines to the end sketches. Shell at the end.

(Lesson 9, 11)



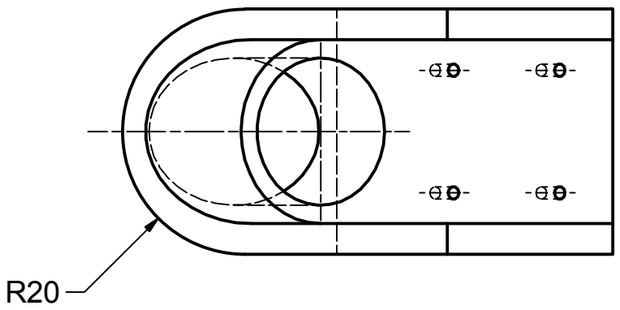


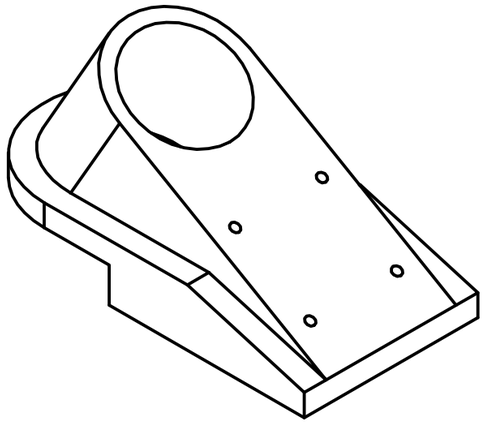


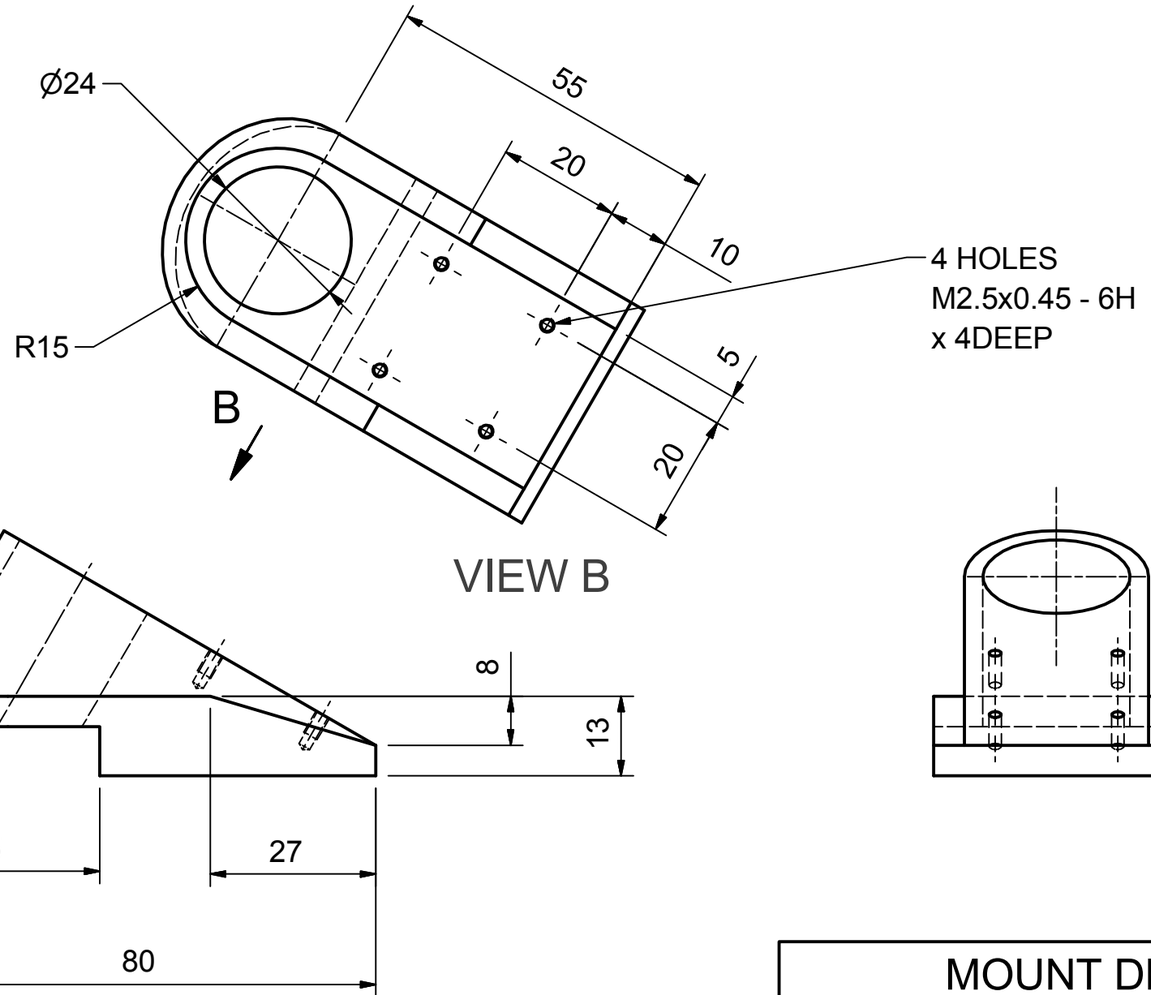
Note:
Wall thickness to be 5mm.
All dimensions to outside surfaces unless specified otherwise.

W.S.I. TAFE Mount Druitt
Engineering Drafting

	Drawn: MCS	Title: Square Transition Bend	
	Checked:		
	Date: March 2014	Scale: 1:2	Drawing Number: Loft_4







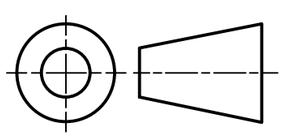
VIEW B

HINT

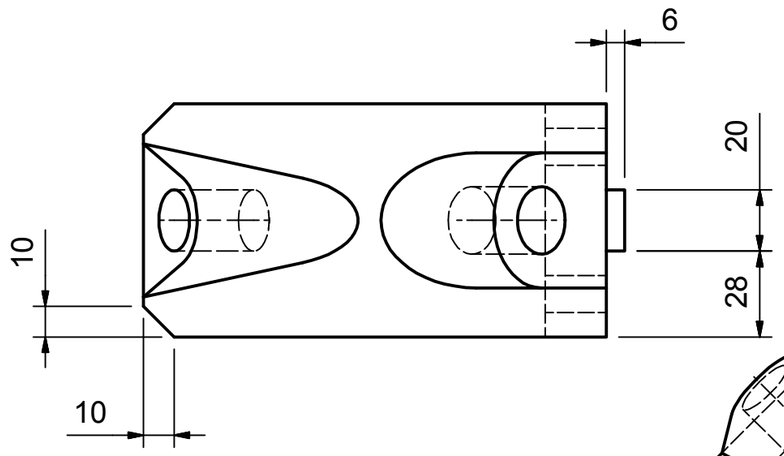
Construct bottom block (80x40x13) then chop off chamfer (27x8), then create Workplane (Angle around edge) then sketch the auxiliary view detail and extrude to next. Finish off holes.

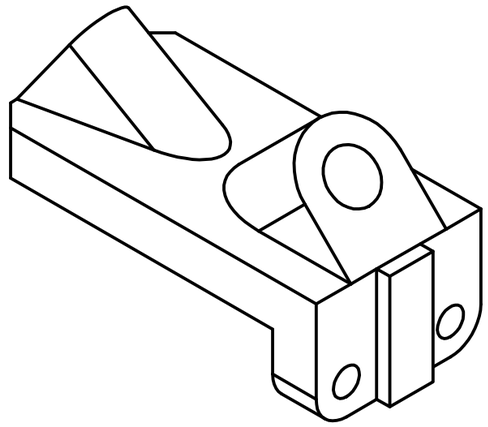
(Lesson 6, 8)

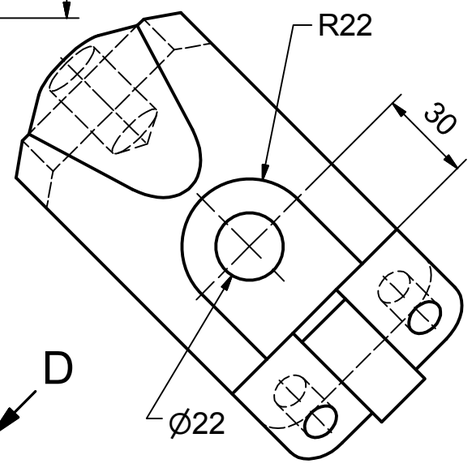
MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

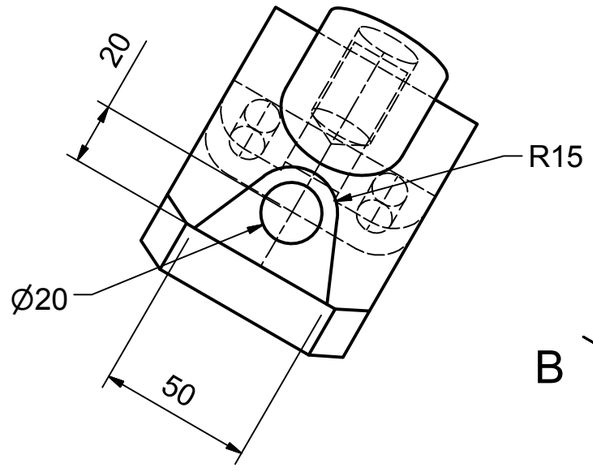


DRAWN P.S.	TITLE ANGLE BLOCK		
CHECKED			
DATE 26:08:03	SCALE 1:1	DRG. NO. INV_AU02	

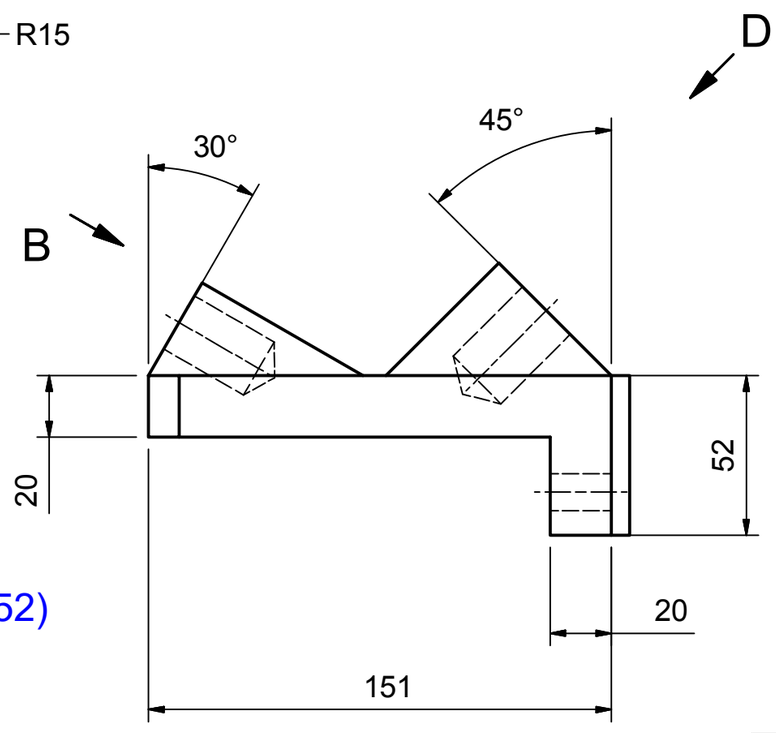




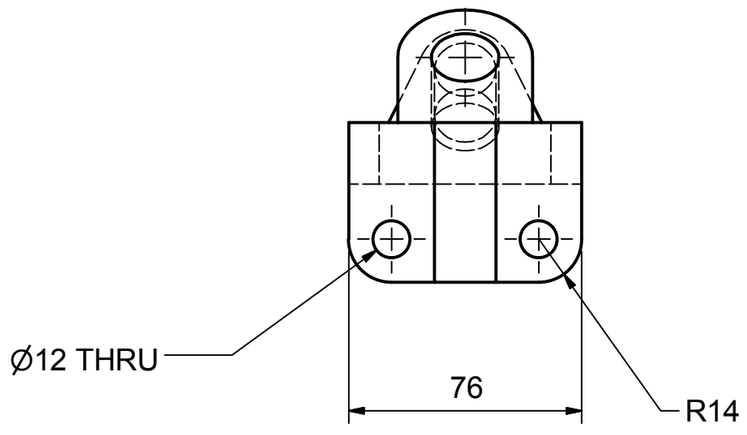




VIEW B



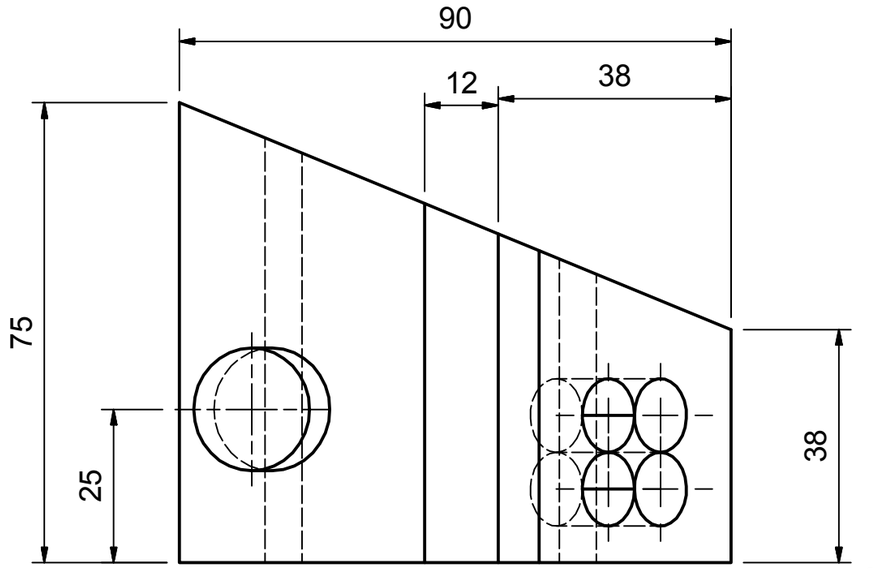
VIEW D

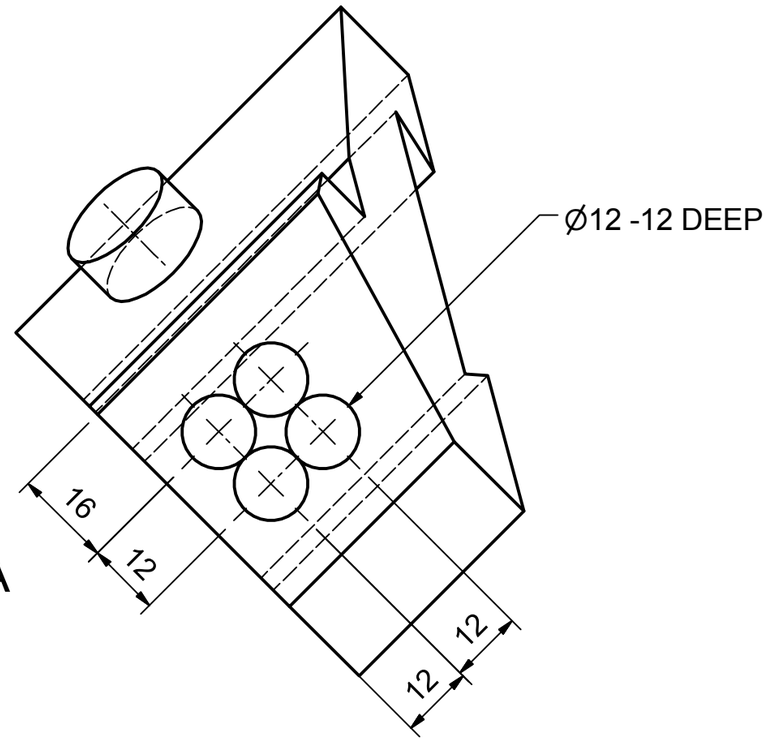


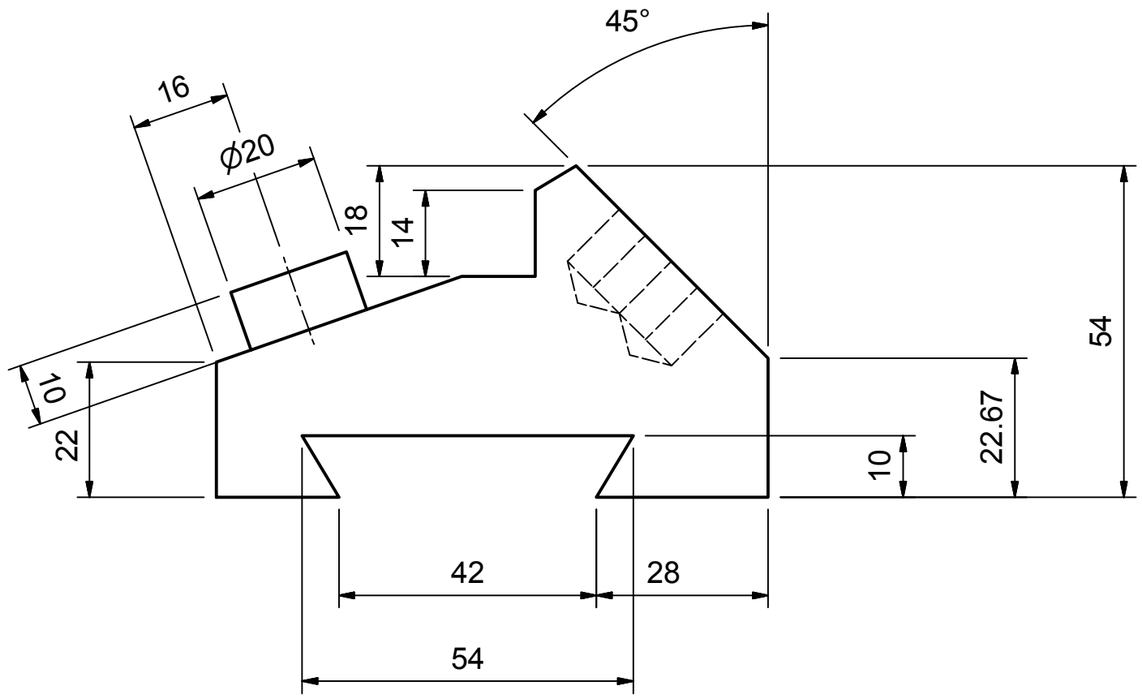
HINT
Construct bottom block (151x76x52)
then create each Workplane
(Angle around edge)
then sketch the auxiliary views
detail and extrude to next.
Finish off holes and chop-outs.
(Lesson 5, 6, 8)

MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

DRAWN P.S.	TITLE GUIDE BLOCK		
CHECKED			
DATE 18:08:03	SCALE 1:2	DRG. NO. INV_AU03	







HINT

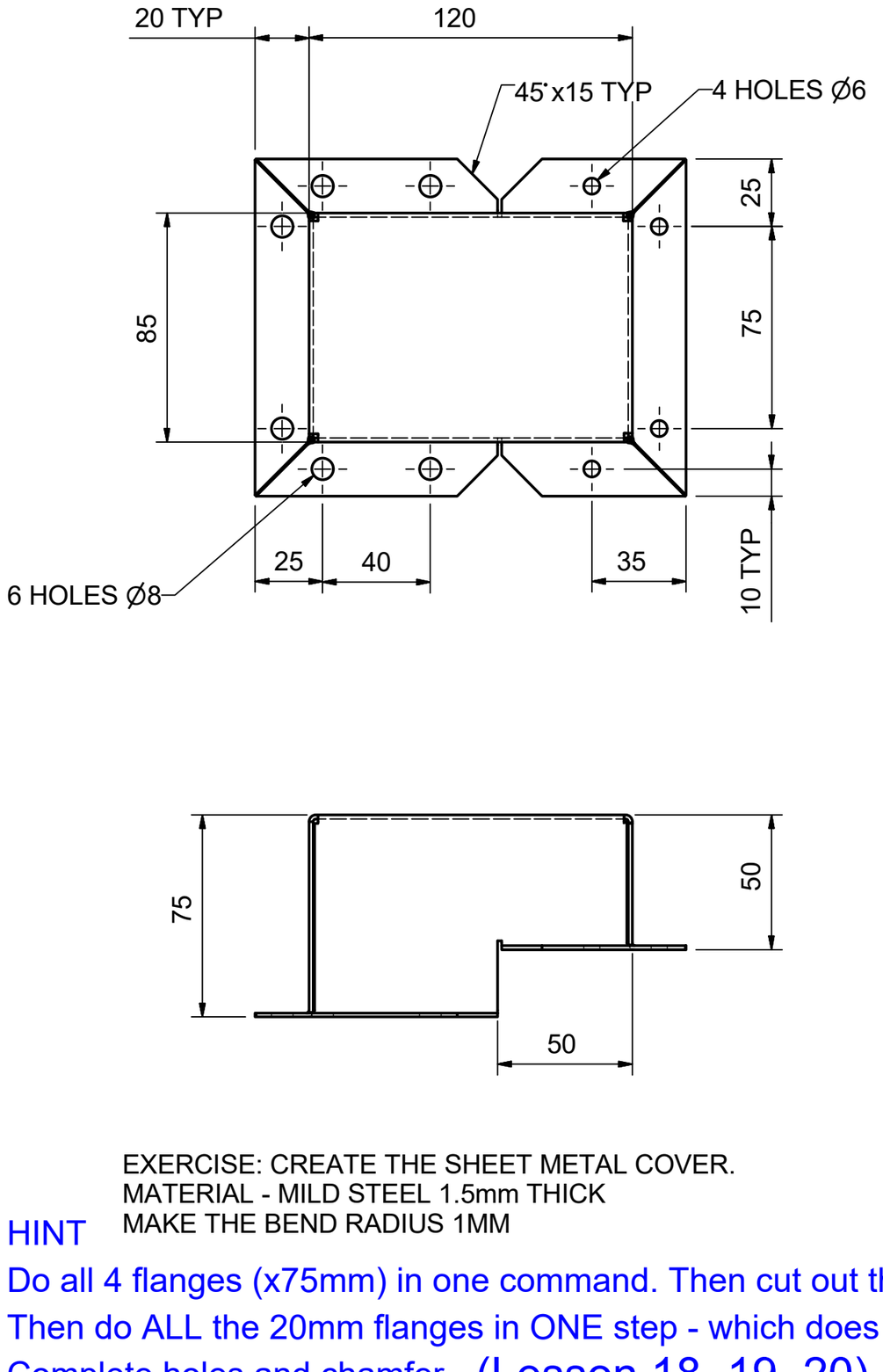
You should be right by now.

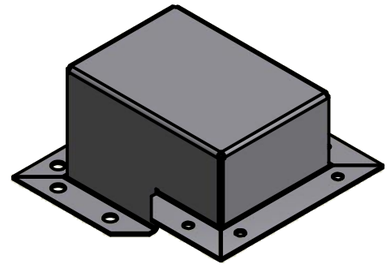
No workplanes needed if you extrude the profile shown bottom view first (to a depth of 75).

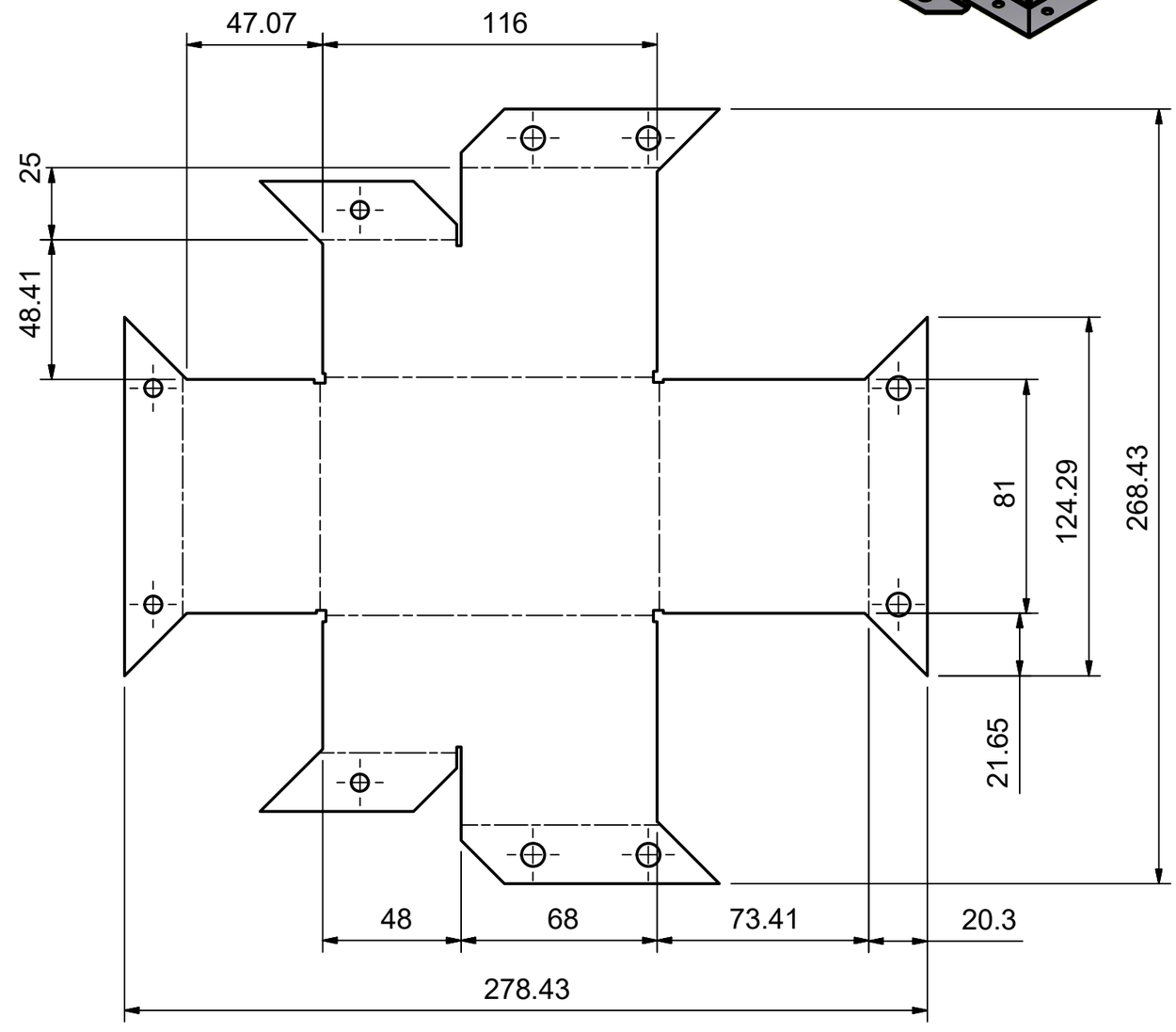
Then cut back from top view and add holes etc

(Lesson 6, 8)

MOUNT DRUITT COLLEGE OF TAFE DETAIL DRAFTING			
	DRAWN P.S.	TITLE BLOCK	
	CHECKED		
	DATE 15:07:2010	SCALE 1:1	DRG. NO. INV_AU05







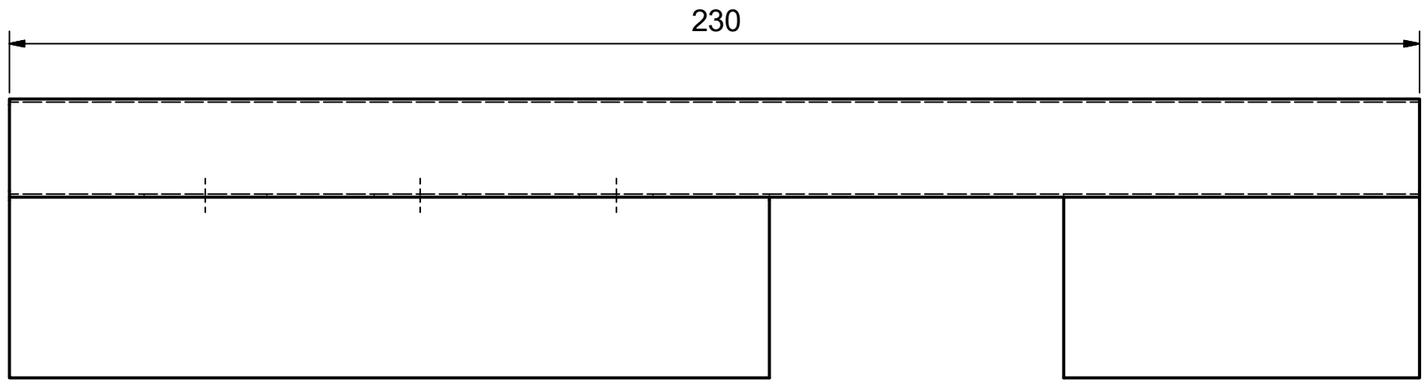
EXERCISE: CREATE THE SHEET METAL COVER.
MATERIAL - MILD STEEL 1.5mm THICK
MAKE THE BEND RADIUS 1MM

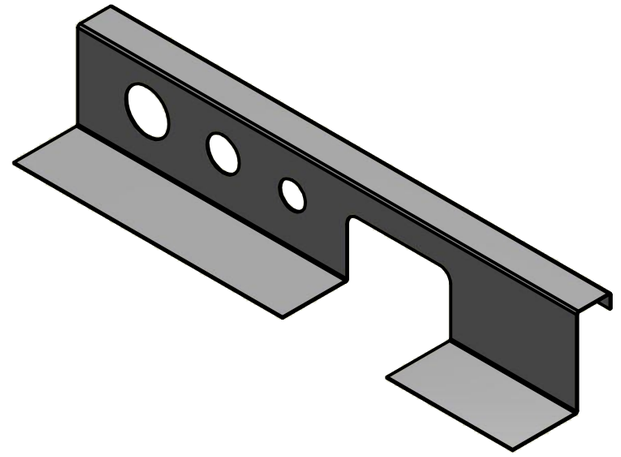
HINT

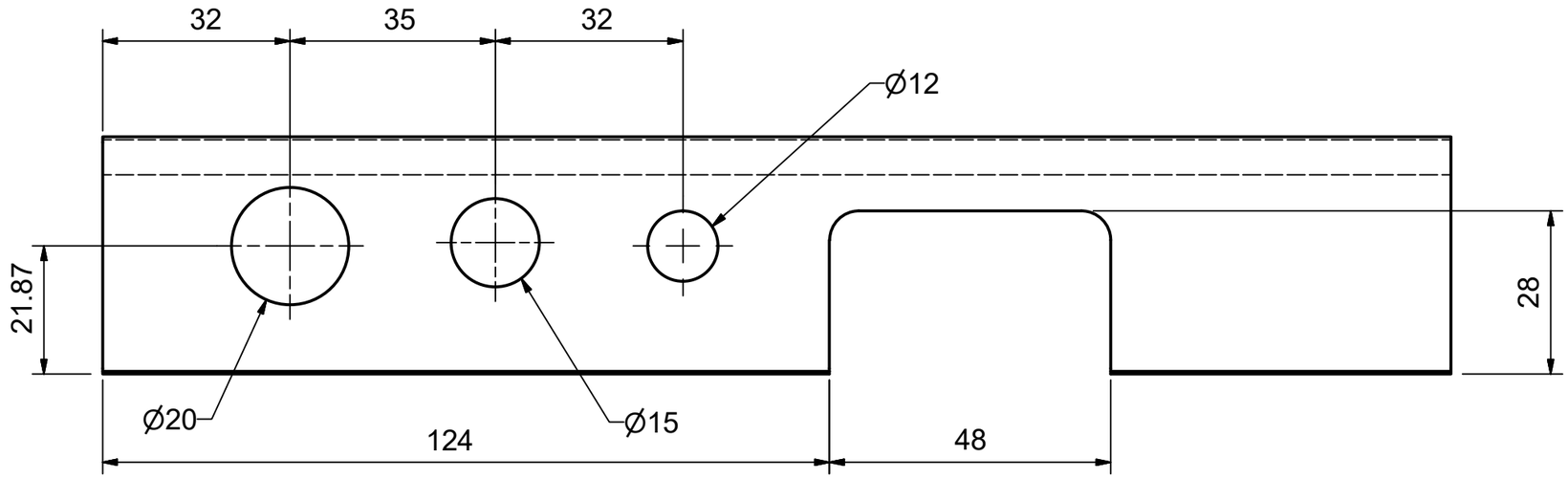
Do all 4 flanges (x75mm) in one command. Then cut out the 50x25.
Then do ALL the 20mm flanges in ONE step - which does the mitres.
Complete holes and chamfer. (Lesson 18, 19, 20)

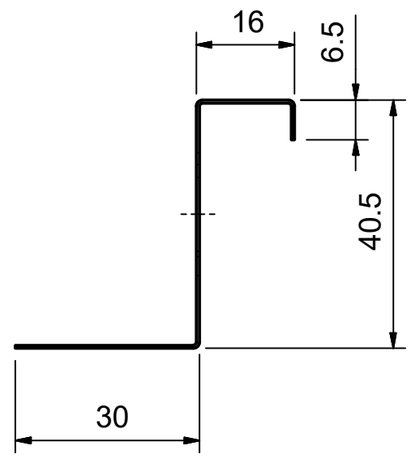
MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

DRAWN MCS	TITLE COVER		
CHECKED			
DATE May 2014	SCALE 1:2	DRG. NO. SHS_01	









HINT

Fold it up first using standard flanges and then do cutouts

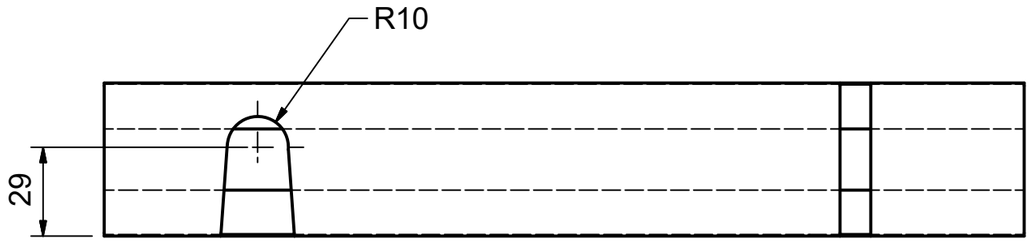
(Lesson 18, 19, 20)

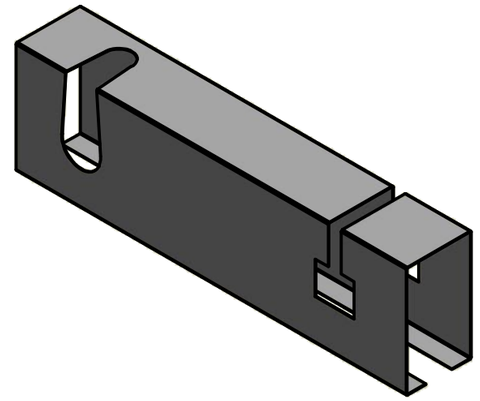
NOTE! ALL BEND RADII 3 UNO

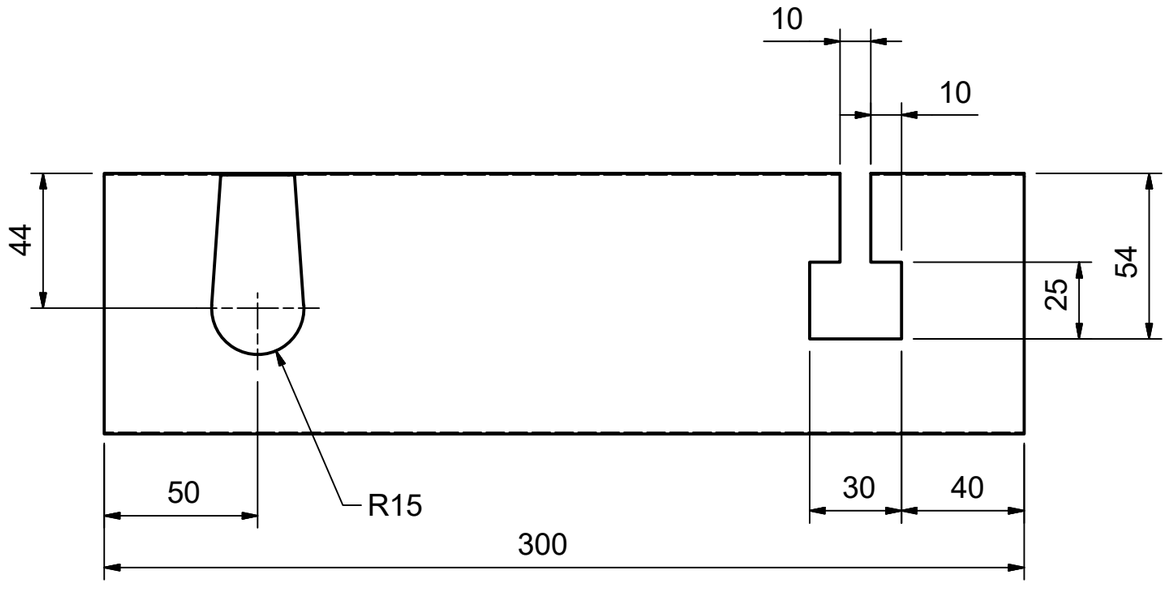
MATERIAL : 1.6mm MILD STEEL

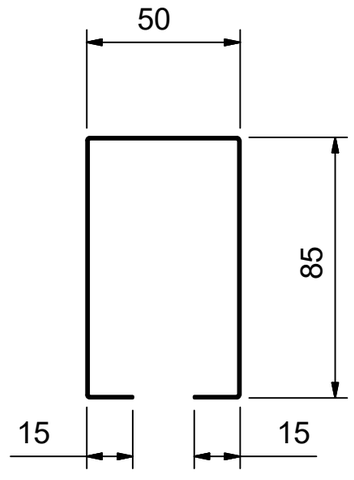
MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

	DRAWN MCS	TITLE BASEPLATE STIFFENER	
	CHECKED		
	DATE May 2014	SCALE 1:1	DRAWING No. SMA_01









MATERIAL : STEEL HIGH STRENGTH LOW ALLOY 2mm THICK

HINT

The R10/R15 cutout must be done BEFORE the fold. (See video)

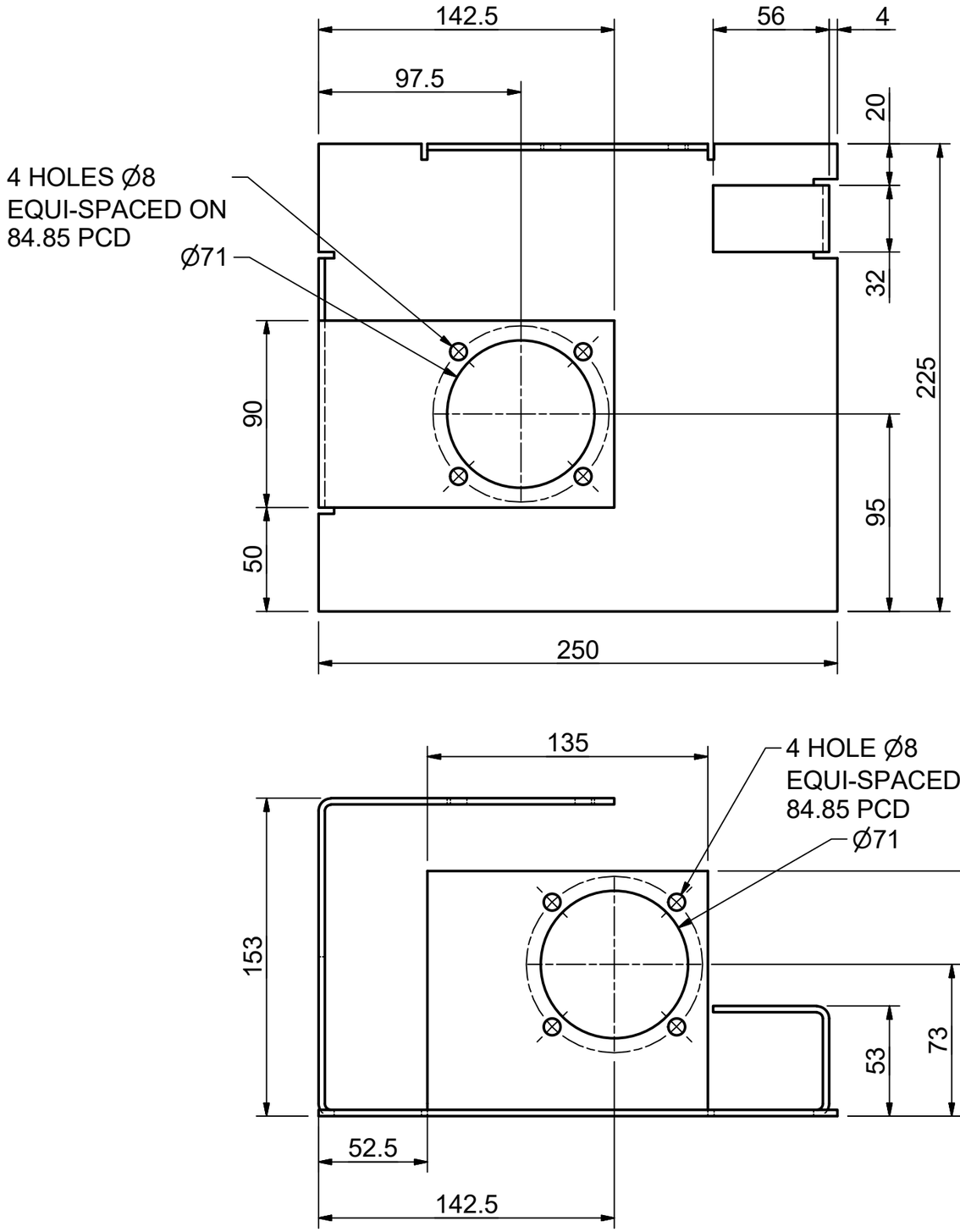
The other (rectangular) cutout is done AFTER the folding. Or you can apply an "across the fold" cutout.

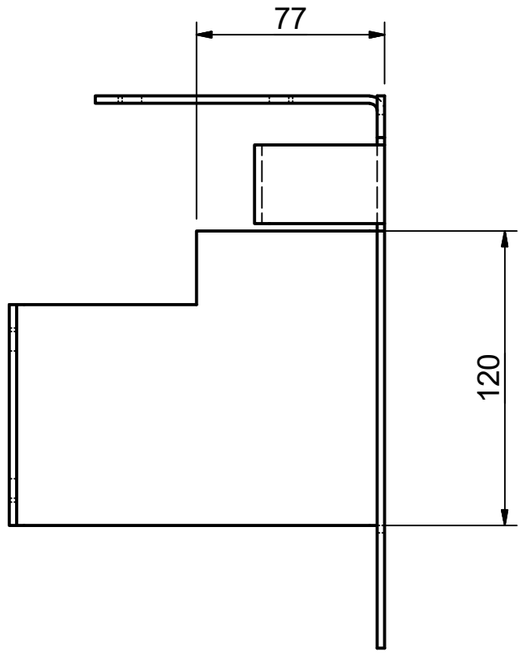
(Lesson 18, 19, 20)

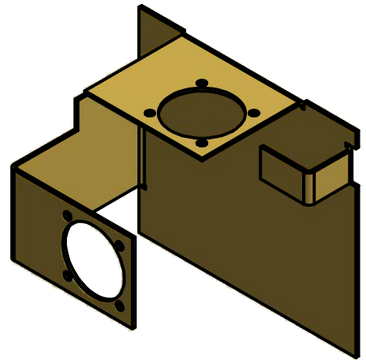
MOUNT DRUITT COLLEGE OF TAFE

DETAIL DRAFTING

	DRAWN P.S.	TITLE CHANNEL BRACKET	
	CHECKED		
	DATE 12:12:2004	SCALE 1:2	DRG. NO. SMA_02







HINT

This is practice of the Offset flange

(expand the flange dialogue box)

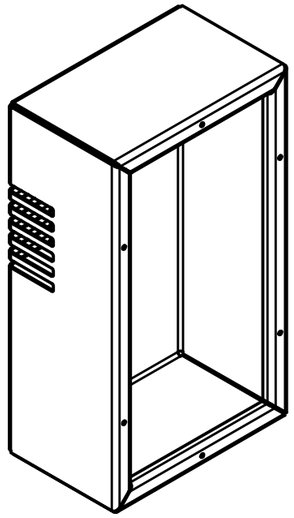
The 32x56 flange is stepped in by 4mm - cutout a 4 x (32 +allowance) first and then apply flange.

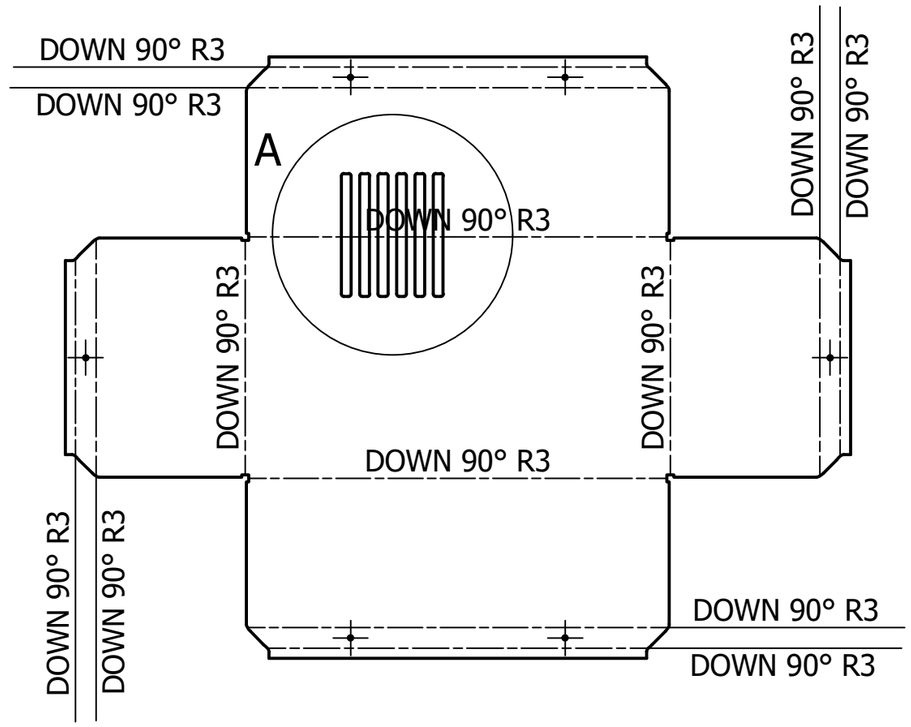
(Lesson 18, 19, 20)

MATERIAL : 3mm MILD STEEL
BEND RADIUS = MATERIAL THICKNESS

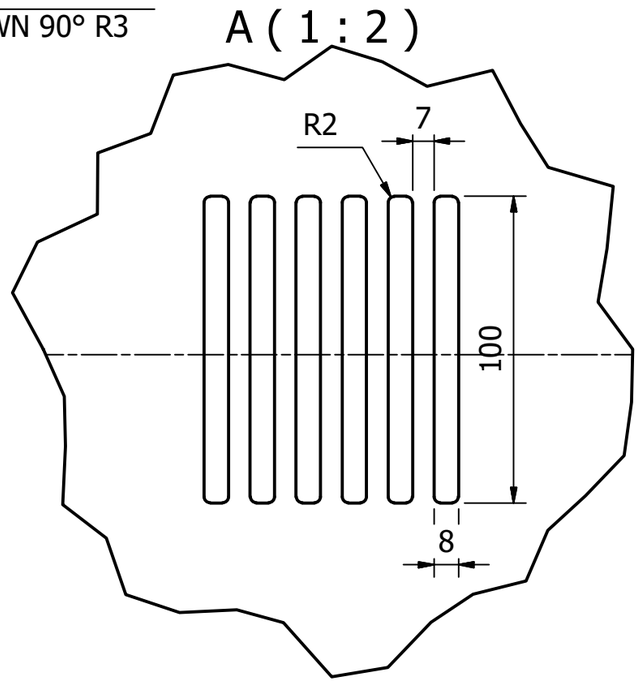
MOUNT DRUITT COLLEGE OF TAFE
DETAIL DRAFTING

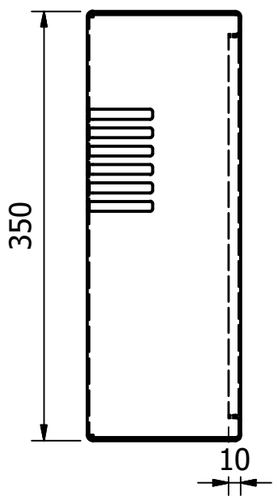
DRAWN MCS	TITLE MOUNTING BRACKET		
CHECKED			
DATE May 2014	SCALE NTS	DRG. NO. SM_02	

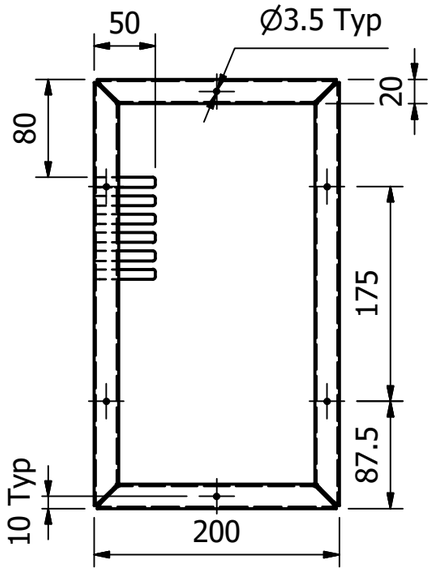




HINT
Do 350x200 face, then do
4 x flanges at 125mm, then
20mm flanges (all in 1 step),
then 10mm flanges.
(Lesson 18, 19, 20)

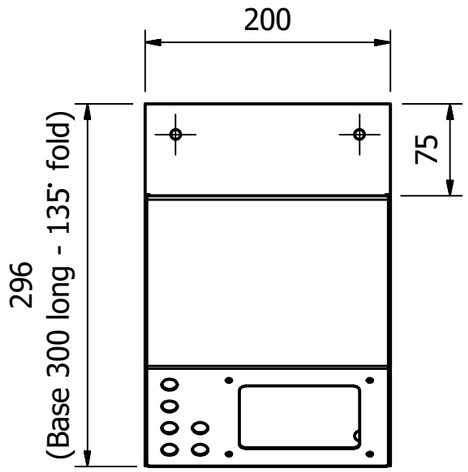






MATERIAL = ALUMINIUM 6061
THICKNESS = 1.5mm
BEND RADIUS = 3mm

W.S.I. TAFE Mount Druitt Engineering Drafting			
	Drawn: MCS	Title: UPS BOX	
	Checked:		
	Date: 17/05/16	Scale: 1:5	Drawing Number: J107-1

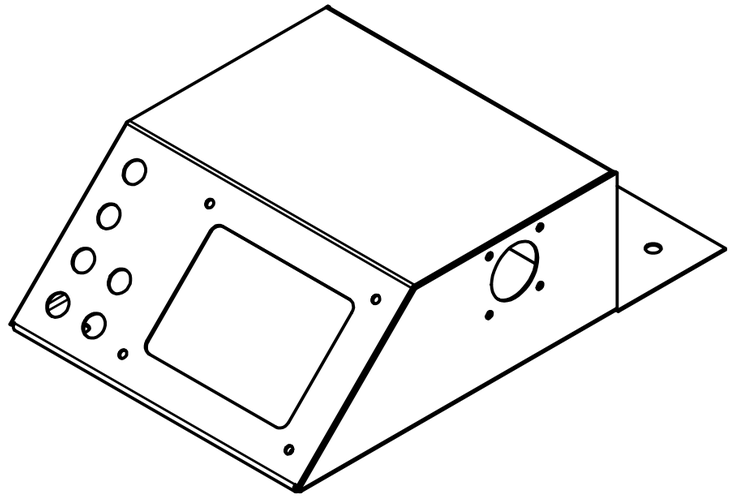


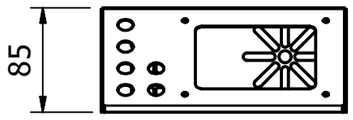
HINT

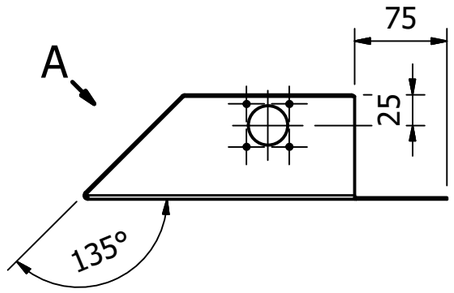
Do 200x375 face, then offset flange sides x 85mm, then the 45 degree flange (check fit against sides and height), then the top and back flanges.

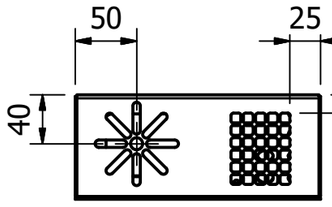
Finish with cut-outs.

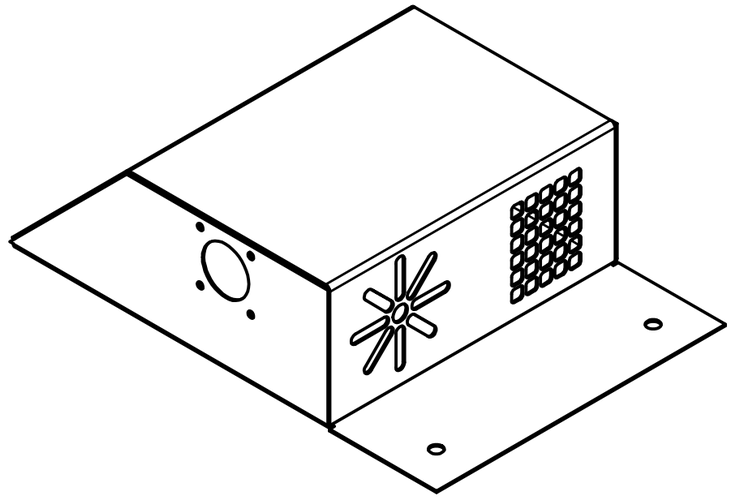
(Lesson 18, 19, 20)

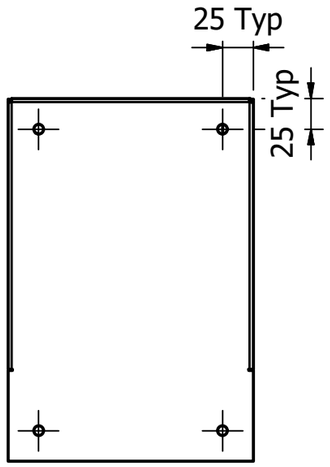


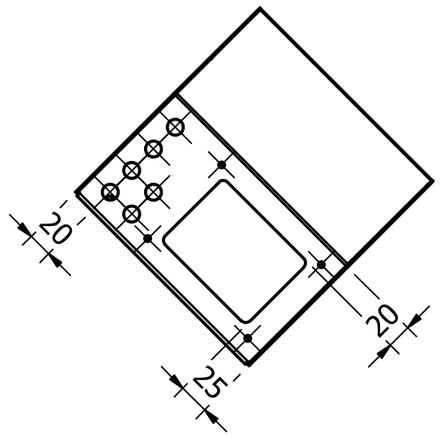












A (1 : 5)

MATERIAL = STAINLESS STEEL
THICKNESS = 1.0mm
BEND RADIUS = 2mm
CORNER/SEAM GAP = 0.5mm

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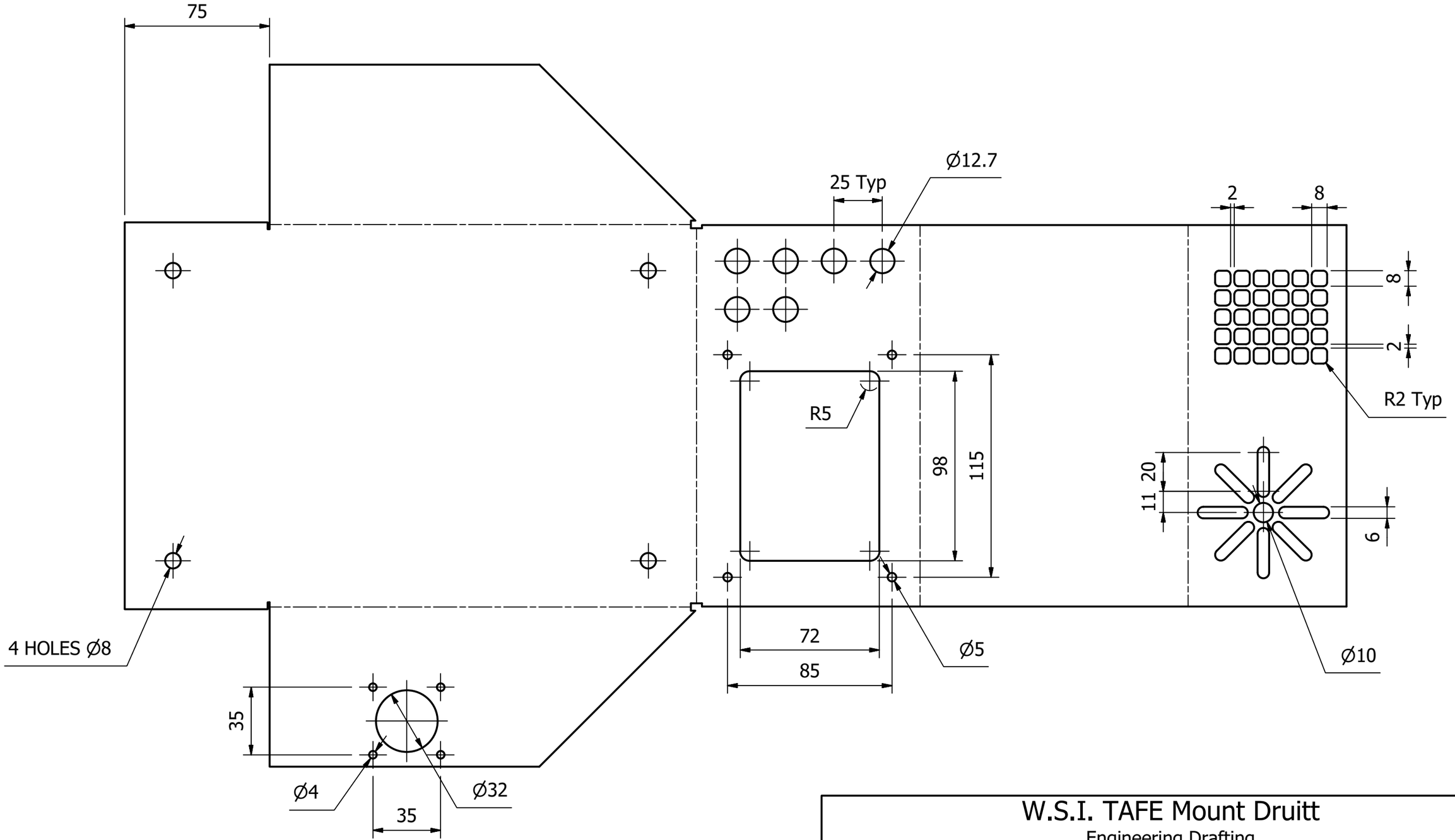
Engineering Drafting

	Drawn: MCS	Title: CNC Control Panel - Sheet 1	
	Checked:		
	Date: 17/05/16	Scale: 1:5	Drawing Number: J217-1



W.S.I. TAFE Mount Druitt

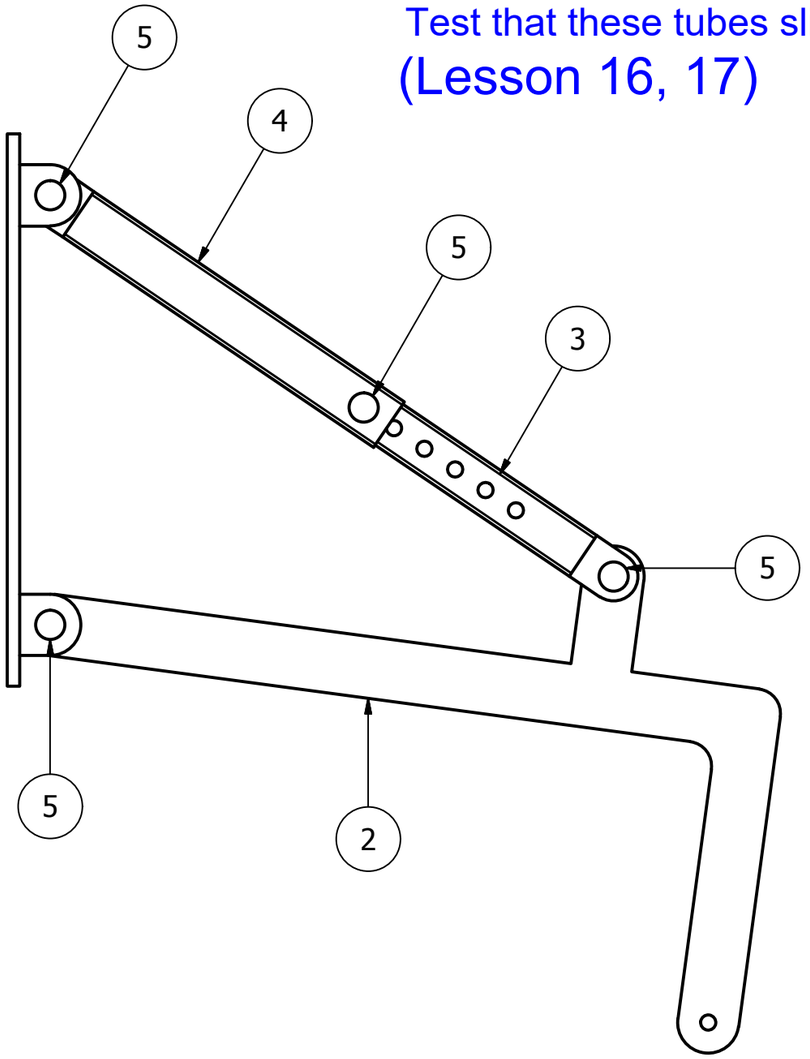
Engineering Drafting

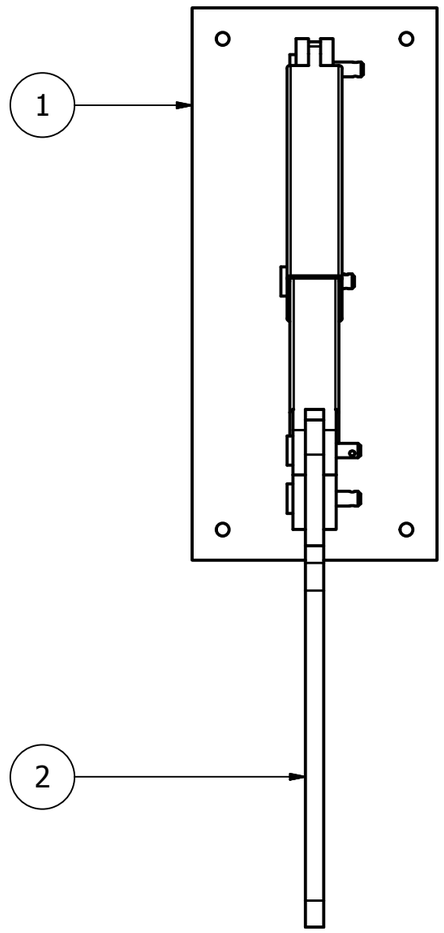
Drawn: MCS	Title: CNC Control Panel - Sheet 2		
Checked:			
Date: 17/05/16	Scale: 1:5	Drawing Number: J217-2	

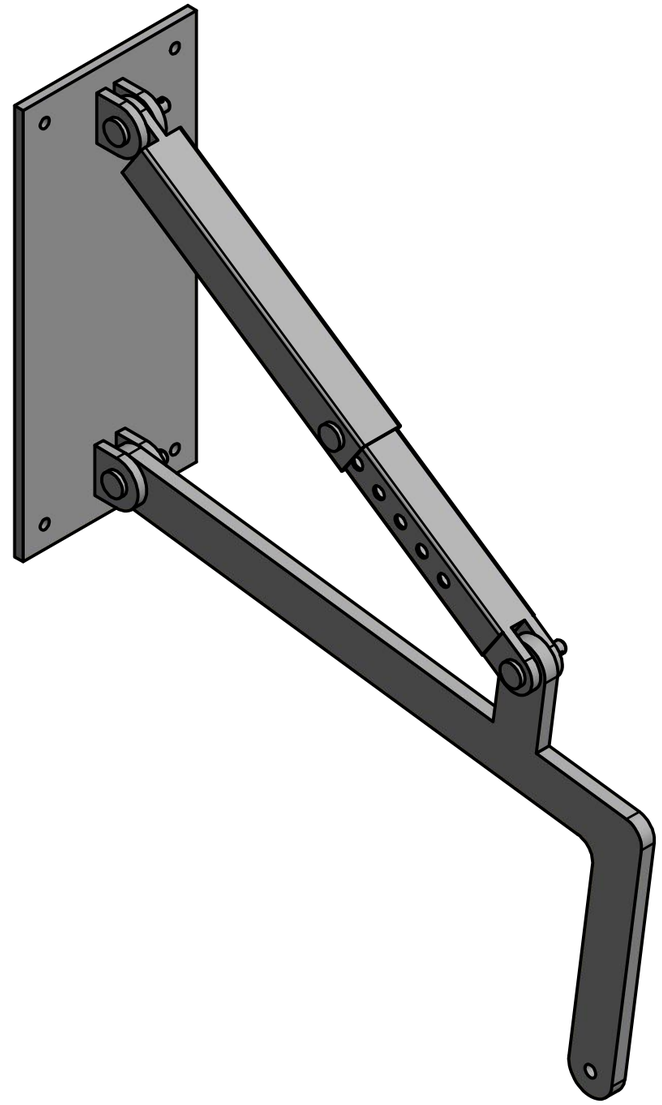
HINT

Build all parts. Bring Wall Plate into new assembly and ground it. Assemble pin joints by mating axis of hole and pin. You will need an angle constraint to hold parts 4 and 3 parallel to each other. Test that these tubes slide together before mating the locking pin.

(Lesson 16, 17)







PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	Wall Plate	
2	1	Support Main Arm	15mm MS Plate - plazma cut profile
3	1	40x40SHS300	
4	1	45x45SHS400	
5	4	Pin	

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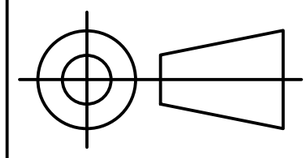
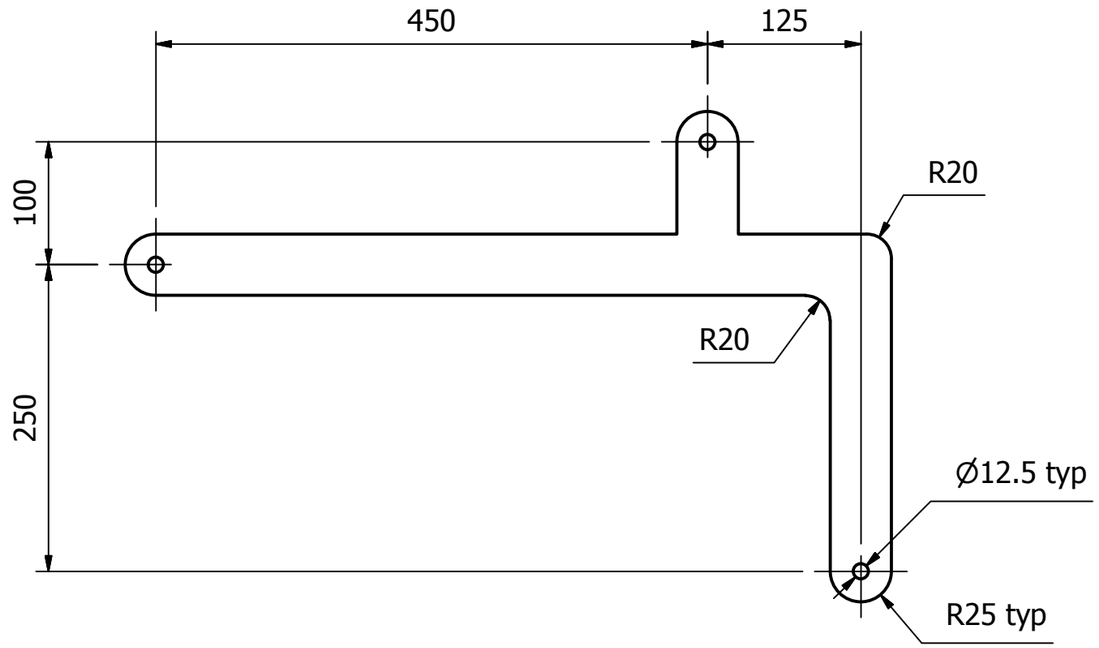
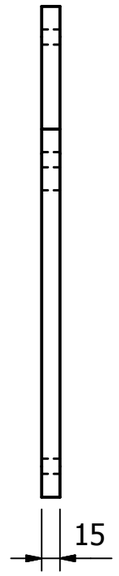
Engineering Drafting



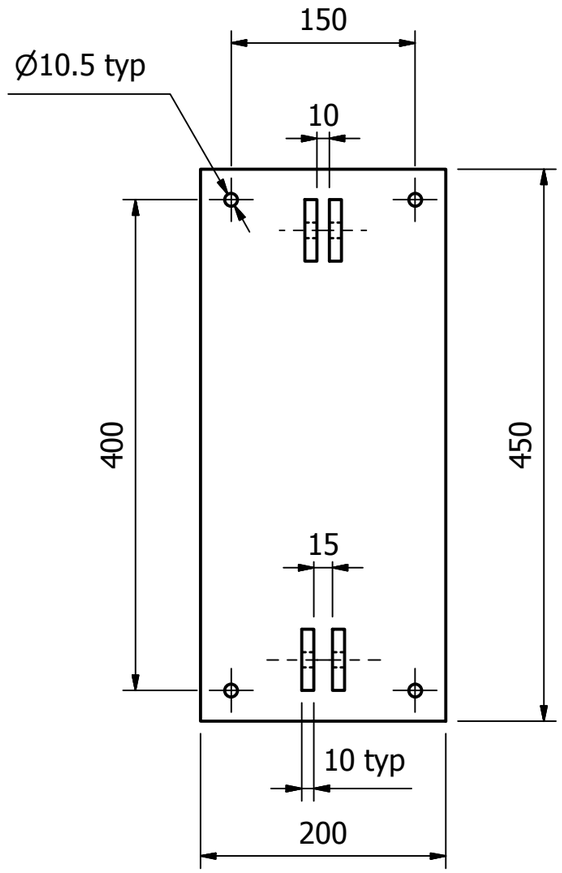
Drawn:	Title:	
Checked:		
Date:	Scale:	Drawing Number:

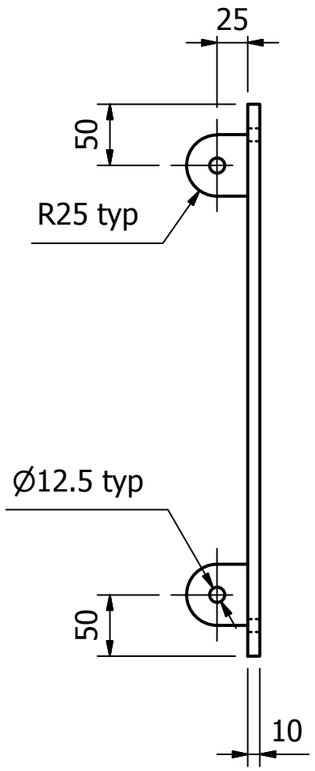


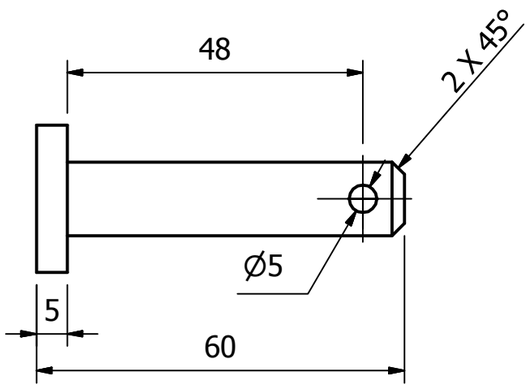


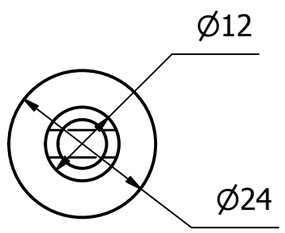
HINT
Build these 3 separate parts as separate *.ipt files.
Make sure you save them into a single folder and do not move or change names using Windows file explorer.
(Otherwise Inventor will loose track of the assembly)
Only ever rename or move files from Inventor itself.

(Lesson 3)









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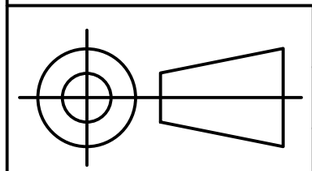
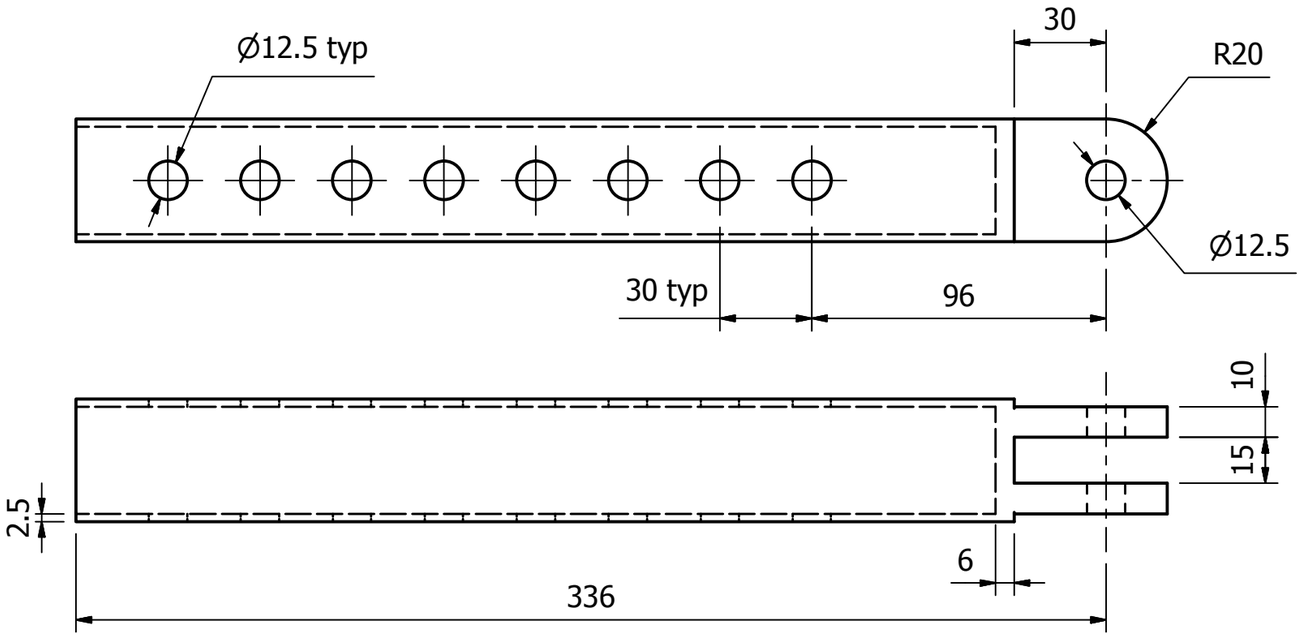
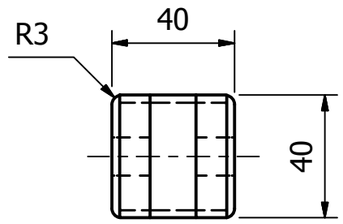
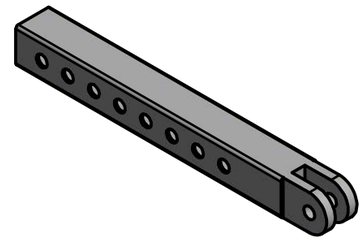
Engineering Drafting

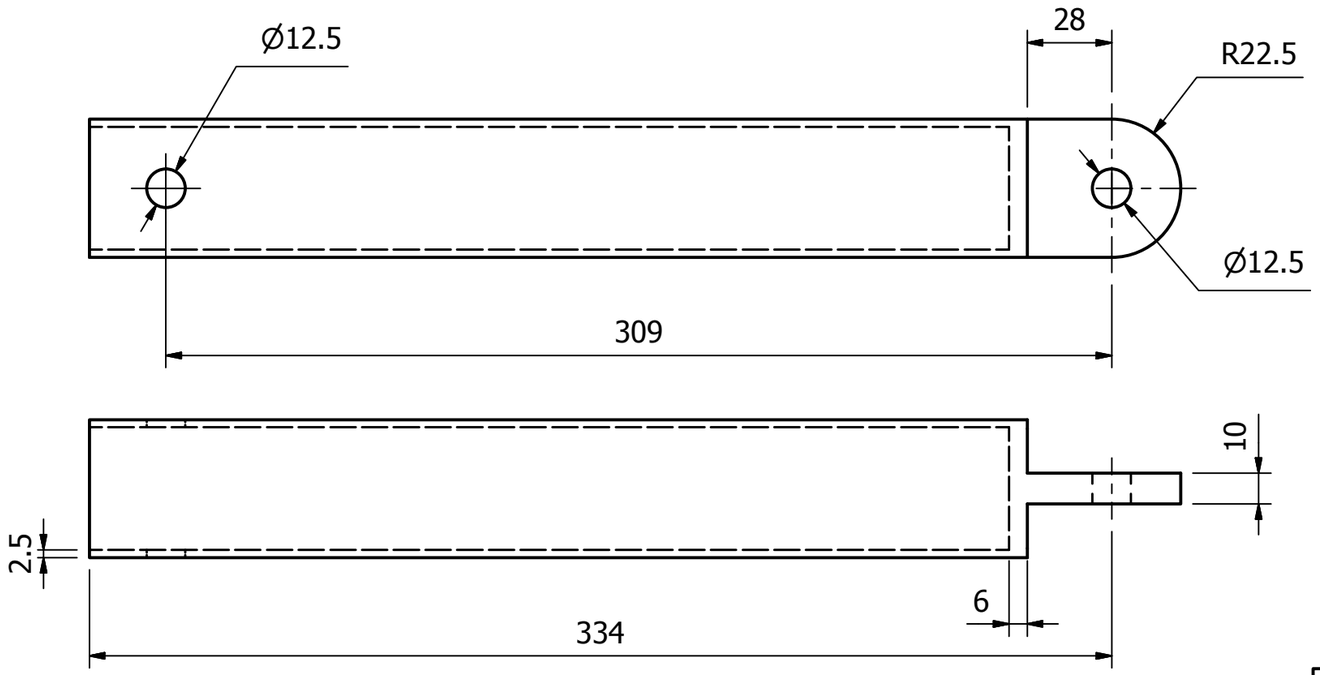


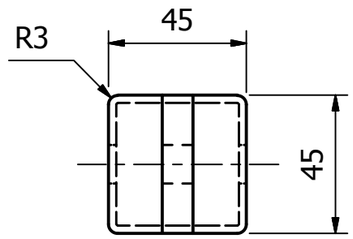
Drawn:	Title:	
Checked:		
Date:	Scale:	Drawing Number:

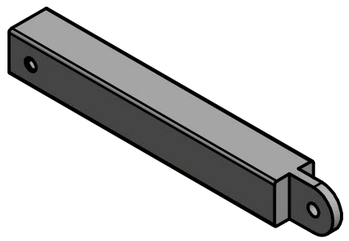












HINT

The 40mm tube slides inside the 45mm tube.

(Lesson 3)

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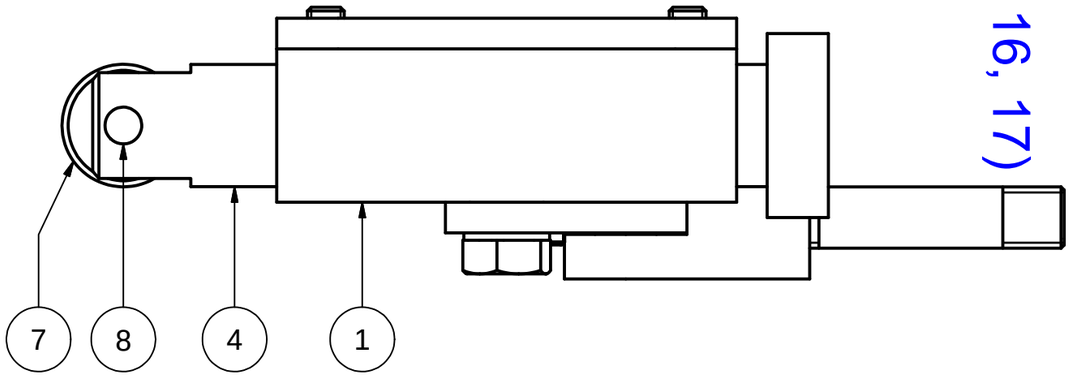
Engineering Drafting

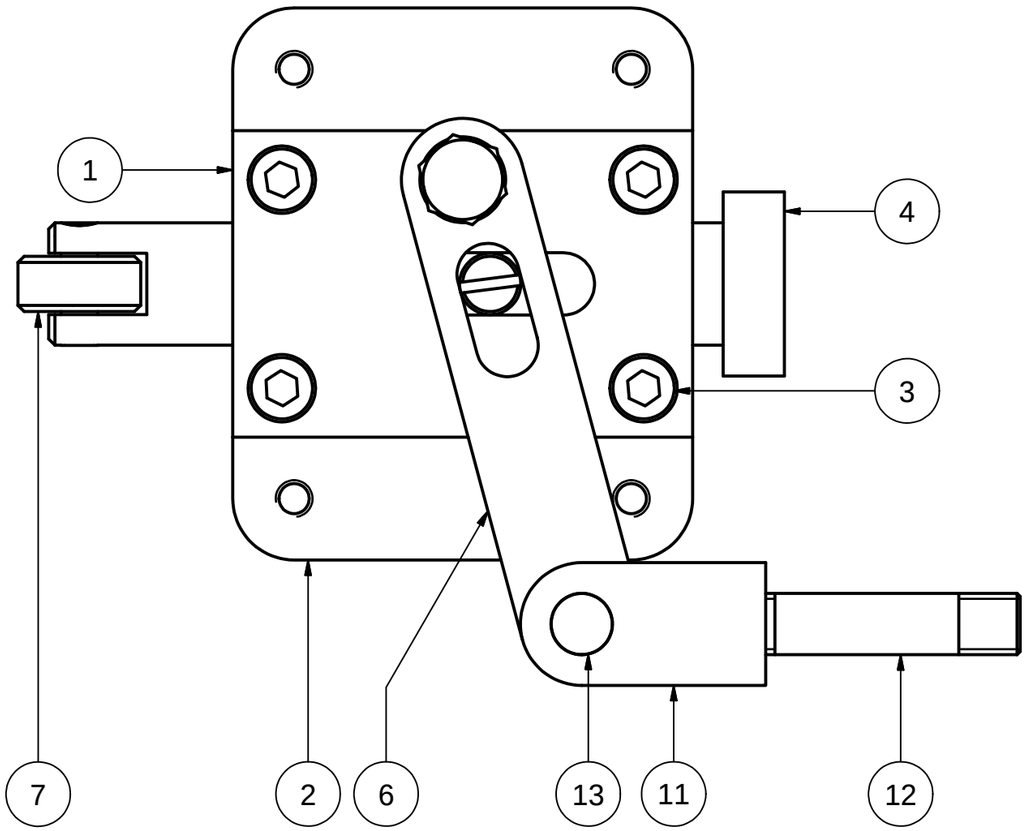
Drawn:	Title:	
Checked:		
Date:	Scale:	Drawing Number:

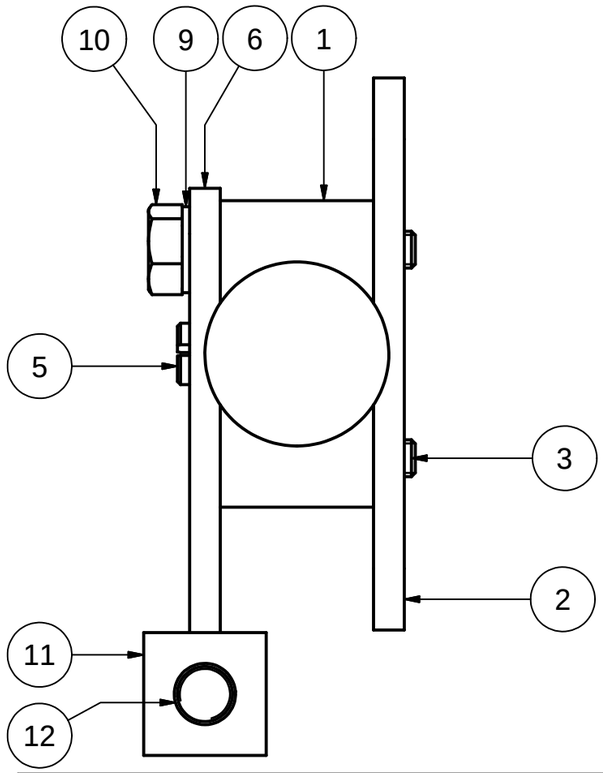
HINT: Build the 13 parts first, then assemble them.
Use the Base Plate (2) as the grounded part.

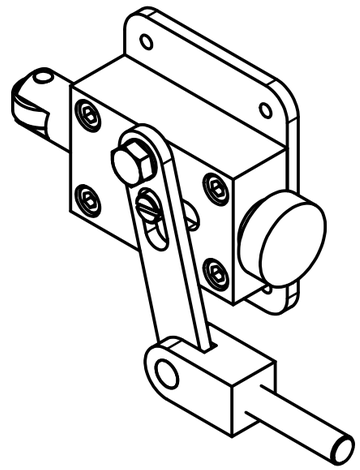
(Lesson 16, 17)



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	Actuator Base	
2	1	Base Plate	
3	4	AS 1420 - 1973 - M6 x 25	ISO metric hexagon socket head cap screws
4	1	Actuator Slide	
5	1	Actuator Slide Pin	
6	1	Actuator Lever	
7	1	Actuator Wheel	
8	1	Actuator Wheel Pin	
9	1	AS 1237 - 8	Flat metal washers for general engineering purposes (metric series)
10	1	CNS 4364 - M8 x 25	Hexagon Fit Screw
11	1	Actuator Rod End	
12	1	Actuator End Stud	
13	1	Actuator Rod Pin	







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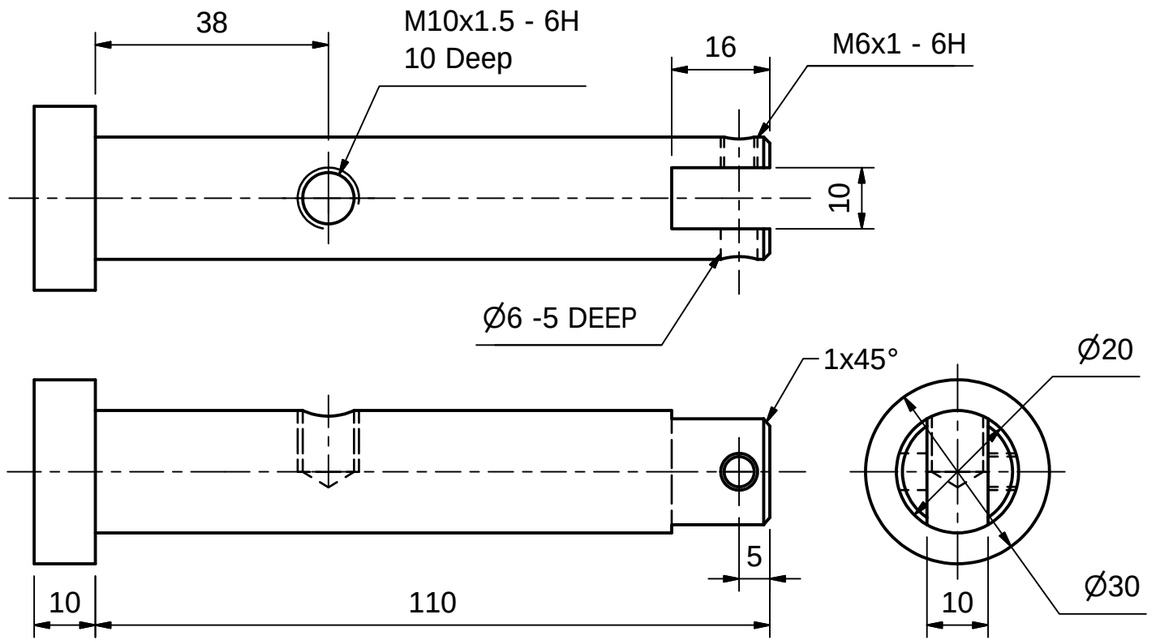
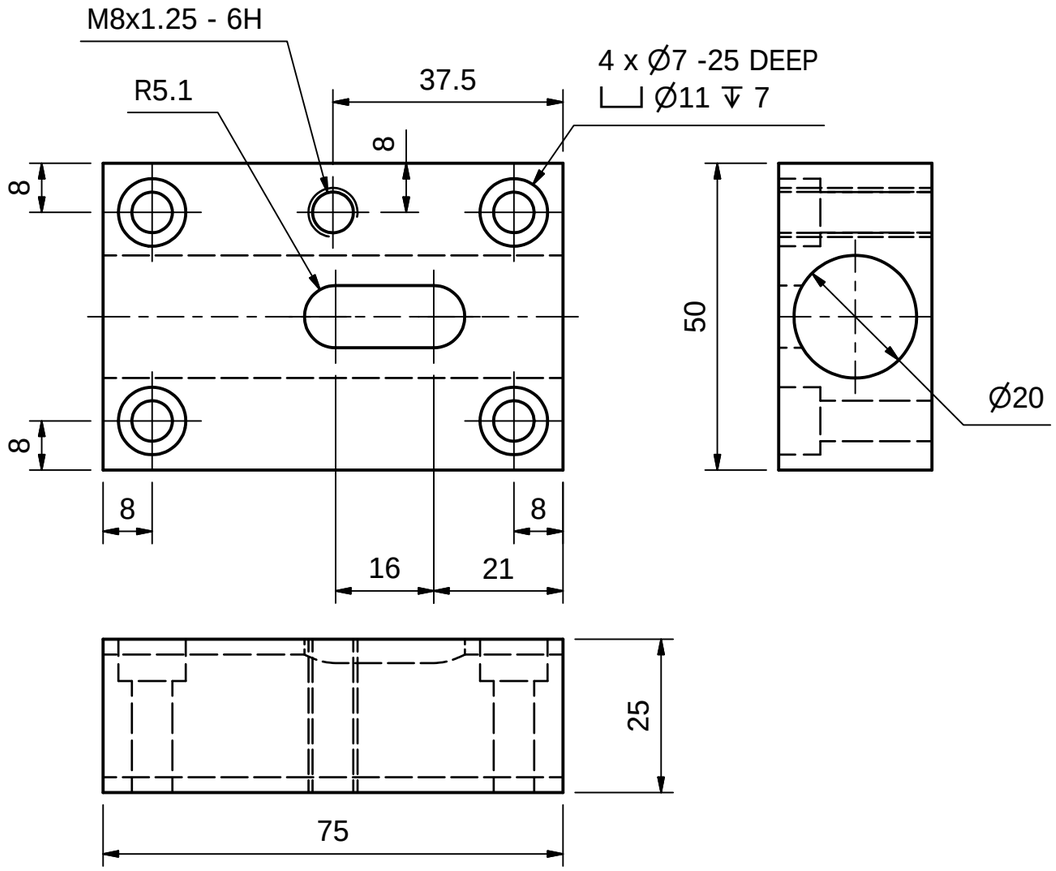
Engineering Drafting

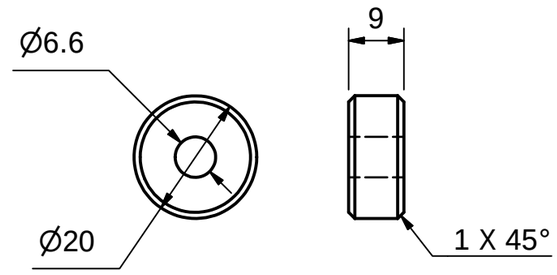
	Drawn: MCS	Title: Actuator Assembly	
	Checked:		
	Date: 12/05/14	Scale: 1:1(A3)	Drawing Number: Actuator - 1A



Item 4 - Slide

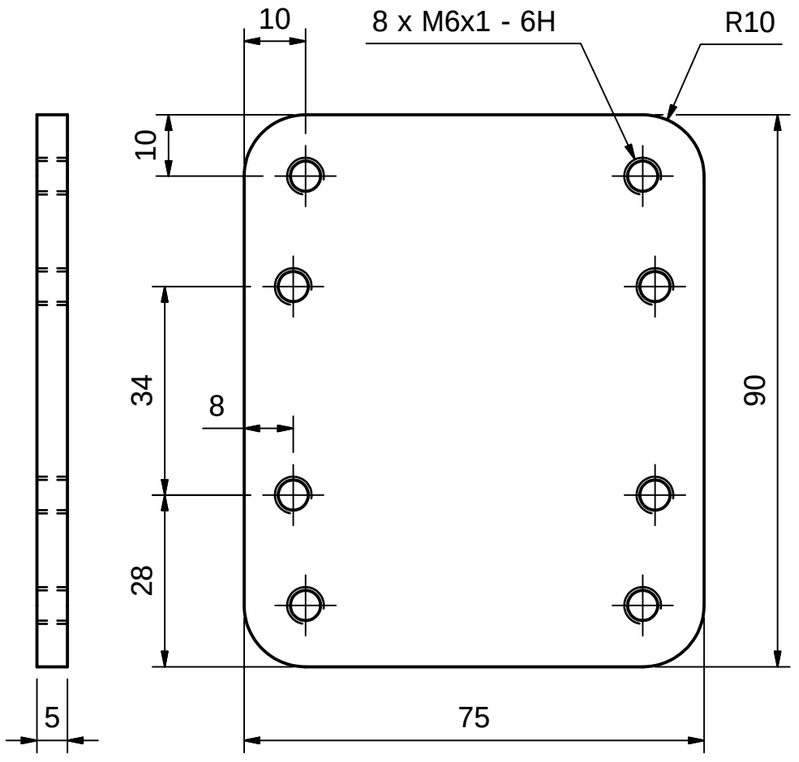


Item 1 - Base



Item 7 - Wheel

HONT:
Build these 4 parts.



Item 2 - Base Plate

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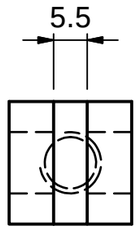
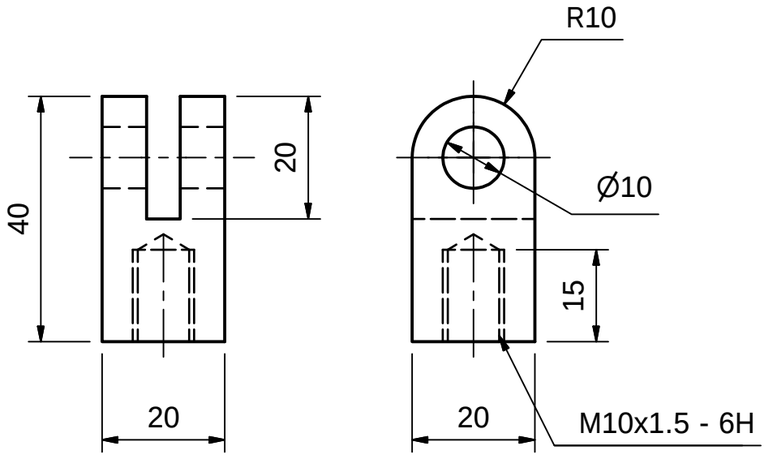
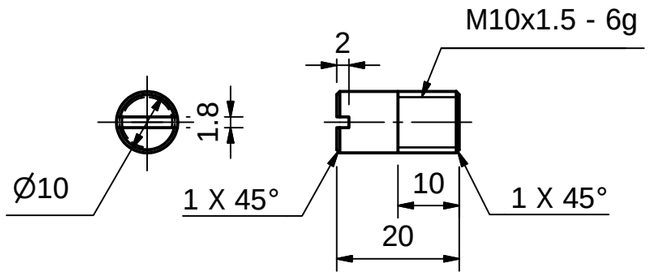
Drawn: MCS	Title: Actuator Parts #1		
Checked:			
Date: 12/05/14	Scale: 1:1(A3)	Drawing Number: Actuator - 2A	



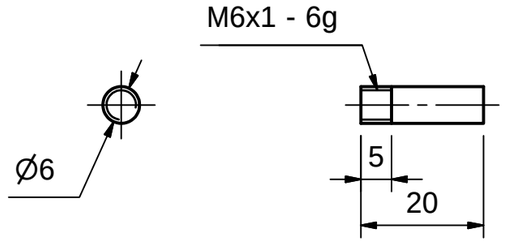


Item 11 - Rod End

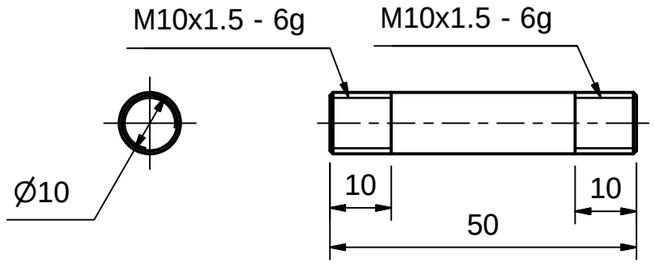


Item 5 - Slide Pin

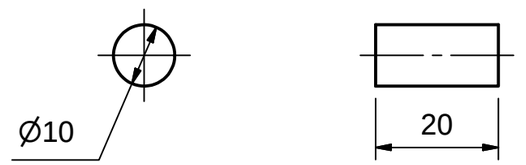
HHINT:
Build these 6 parts. You never have to repeat a multiple part since the assembly can bring the one part in multiple times.



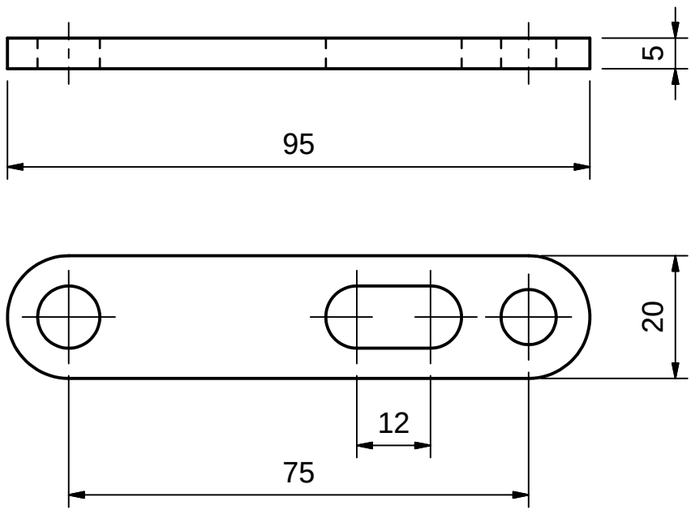
Item 8 - Wheel Pin



Item 12 - Rod End Stud



Item 13 - Rod End Pin



Item 6 - Lever

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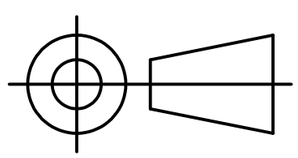

Drawn: MCS	Title: Actuator Parts #2	
Checked:		
Date: 12/05/14	Scale: 1:1(A3)	Drawing Number: Actuator - 3A

Task Set 8: Create a drawing for each of the following;
Do all drawings exactly as shown in PDF, all on A3 sheet with border & title block.

1. Detail drawing of Bracket (IF-Extrude-8)

2. Detail drawing of Bearing Retainer (IF-Revolve-4)

3. Detail drawing of Cover (SHS-01)

4. Assembly drawing of Actuator Assembly (Acuator-01)