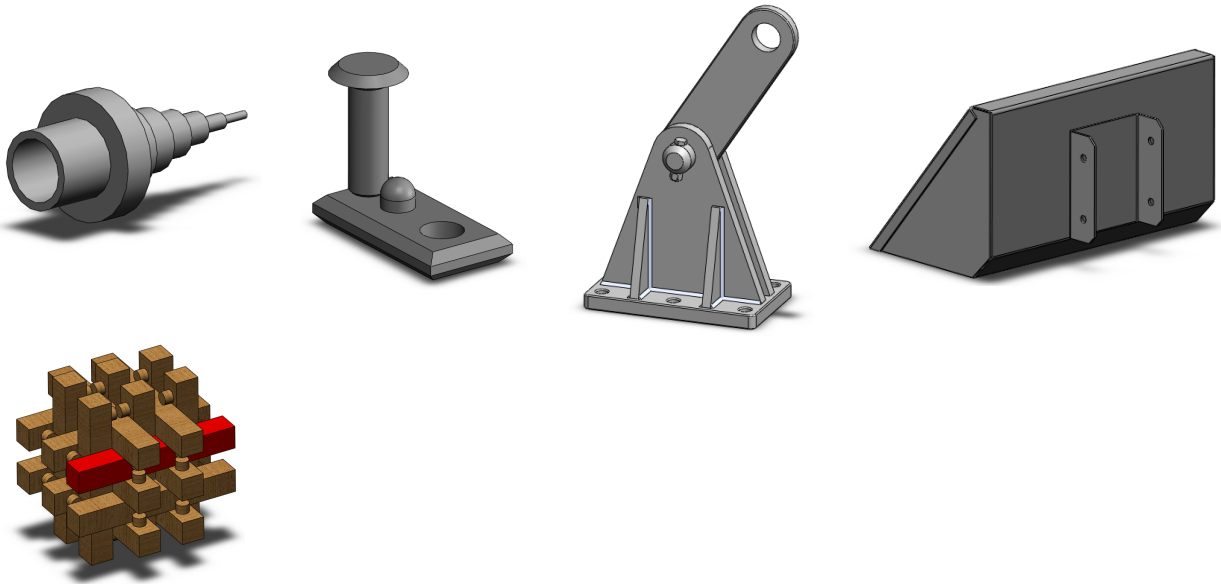


SolidWorks® tutorials

EXERCISES



Junior and Senior Secondary Technical Education



Voor gebruik met SolidWorks® Educational Release 2008-2009

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Concord, Massachusetts 01742 USA
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Initiative: Kees Kloosterboer (SolidWorks Benelux)

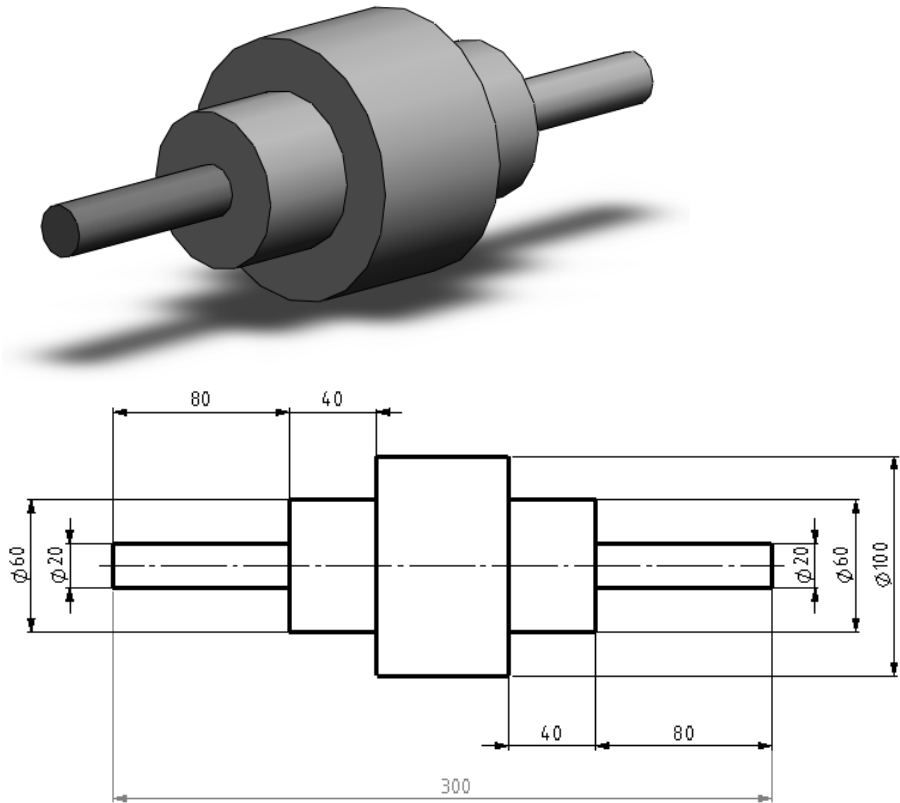
Educational coordination: Jack van den Broek (specialist class Dr. Knippenberg)

Realization: Arnoud Breedveld (PAZ Computerworks)

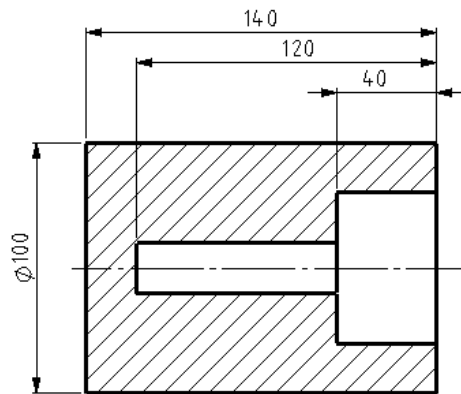
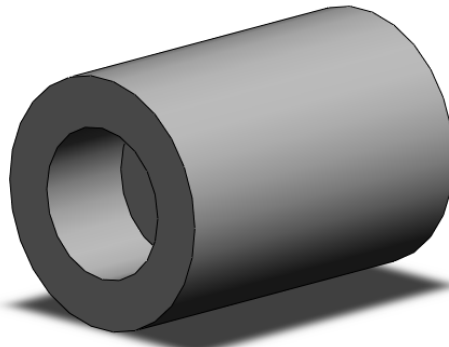
Exercises	
Approach	<p>Congratulations! You have already worked through the first few SolidWorks tutorials, so you already have some understanding of SolidWorks. In order to really get to know the program, it is important that you practice a lot! That is why we have put this bundle together. You now have a large number of exercises to help you become familiar with SolidWorks.</p> <p>The best idea is to do the relevant exercises from this bundle every time you have completed a SolidWorks tutorial. You can then put what you have learnt into practice straight away.</p> <p>The exercises you are going to do depend on each other. This means that: you may make an axle in the exercises for tutorial one, another part in tutorial 3 and then put them together in an assembly in tutorial 7. It is therefore very important that you save everything that you make (parts, assemblies and drawings)! Create a new folder for this purpose. You could call this folder “SolidWorks exercises”, for example. Always give the file the same name as the exercise (for example: Exercise1-1sldprt).</p> <p>Most of the exercises do not have an explanation. You should be able to model the part using the drawing.</p> <p>Have fun drawing and good luck!</p>

Tutorial 1 Exercises

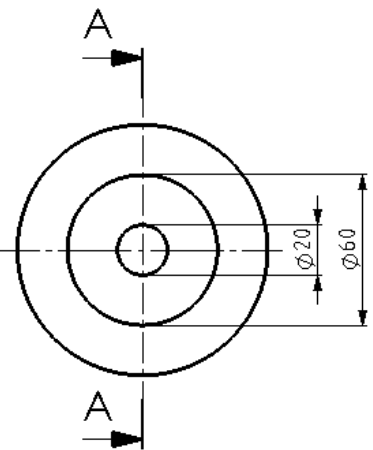
Exercise 1-1



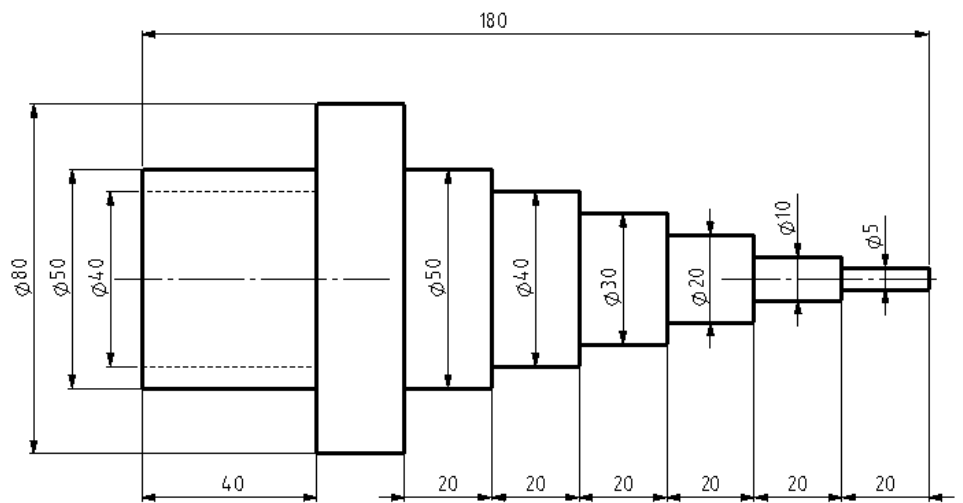
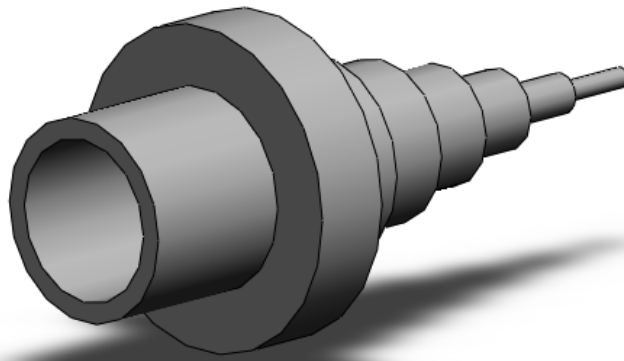
Exercise 1-2



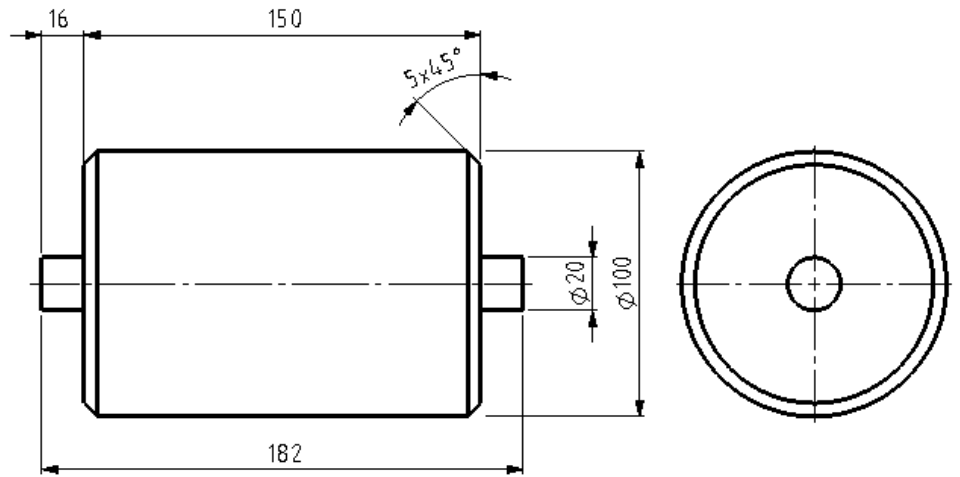
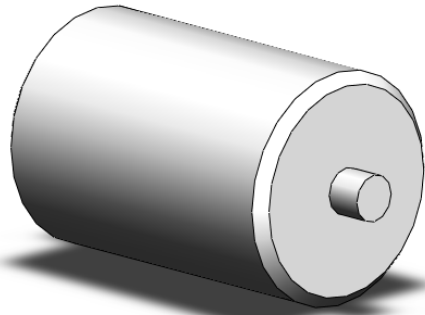
SECTION A-A



Exercise 1-3

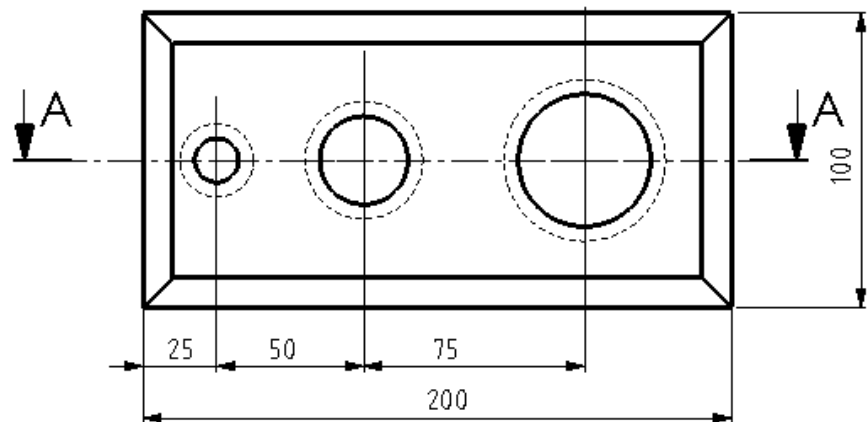
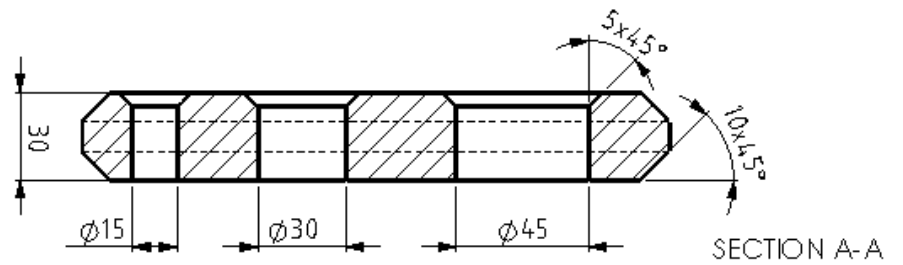
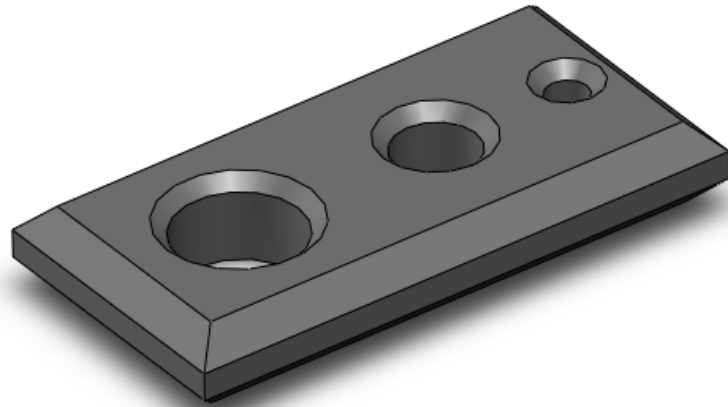


Exercise 1-4

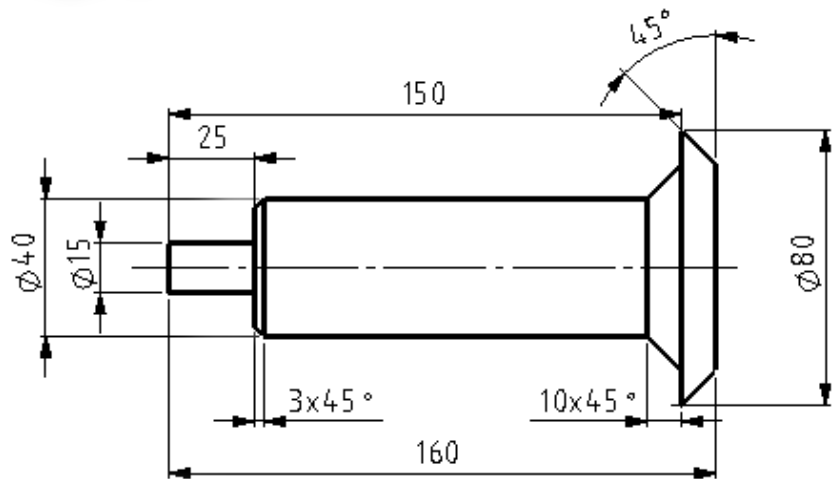
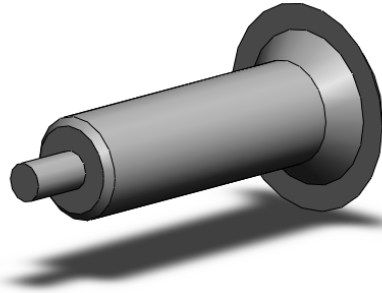


Tutorial 2 Exercises

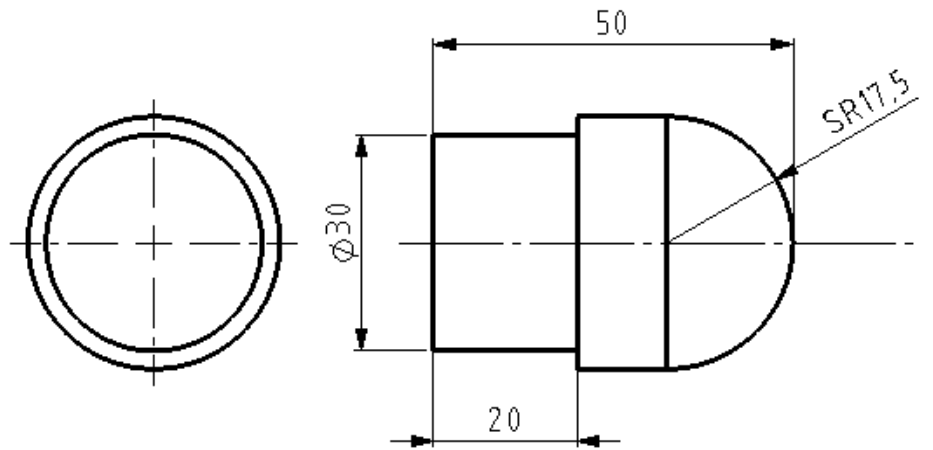
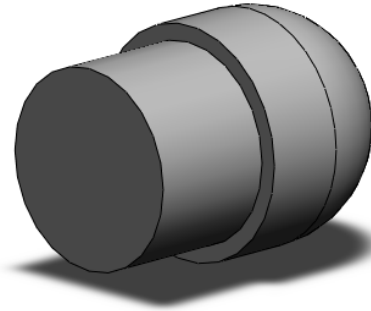
Exercise 2-1



Exercise 2-2

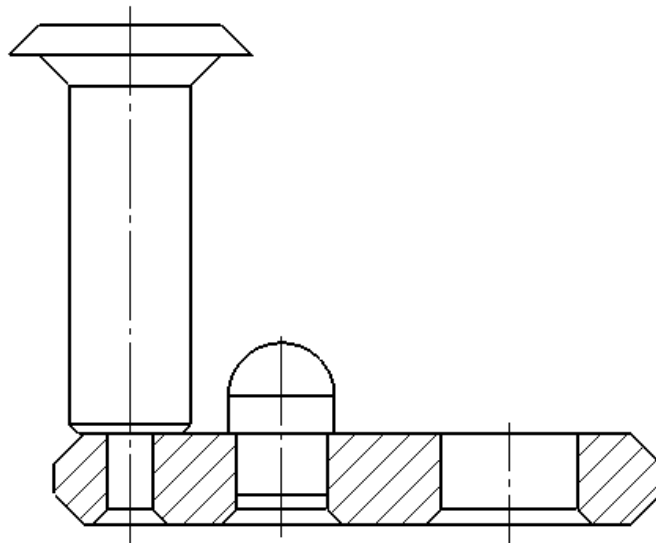
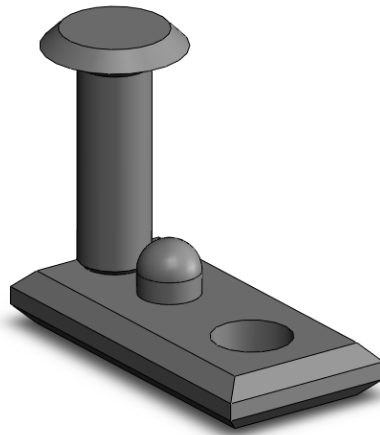


Exercise 2-3

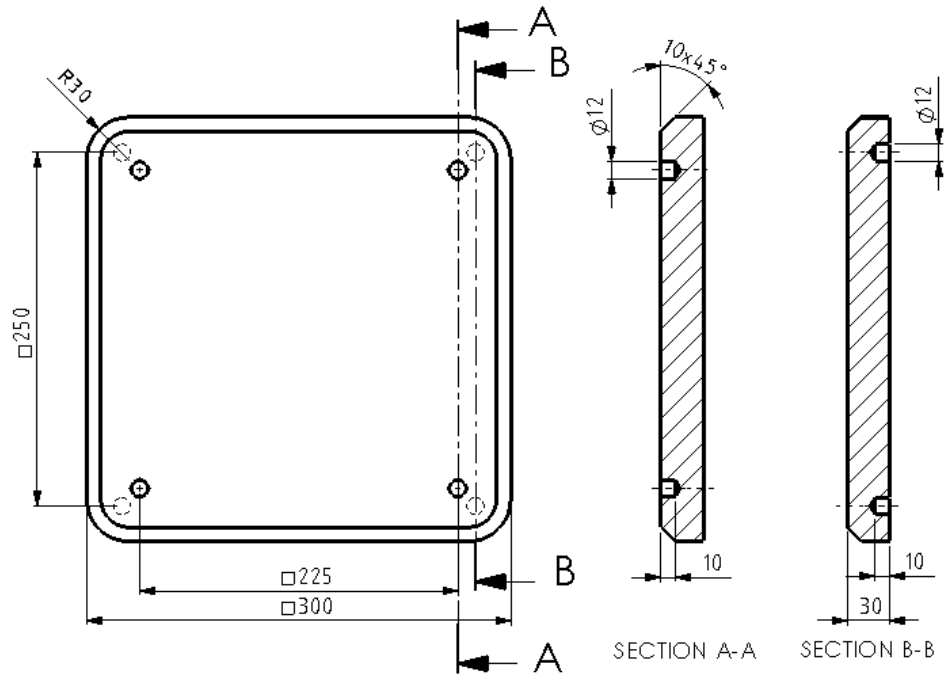
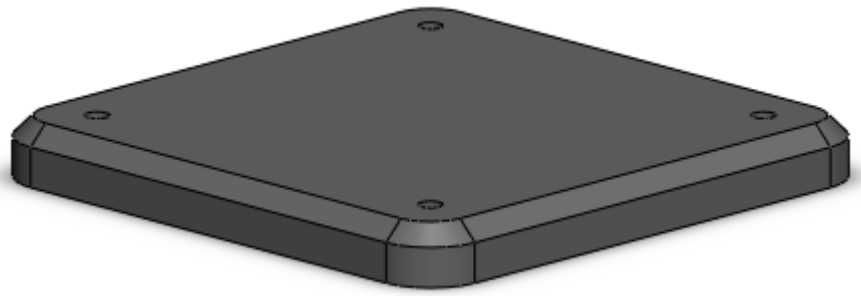


Exercise 2-4

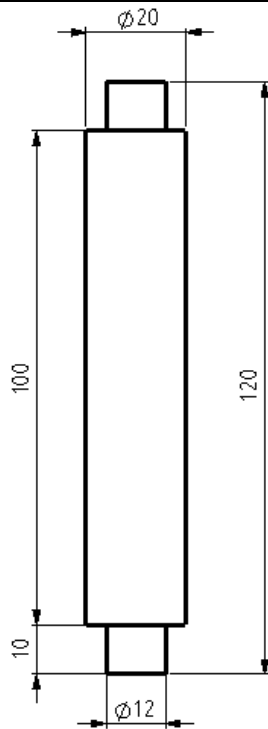
Use the parts from exercises 2-1 through 2-3 to make the assembly shown on the right.



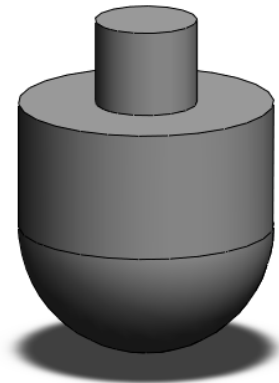
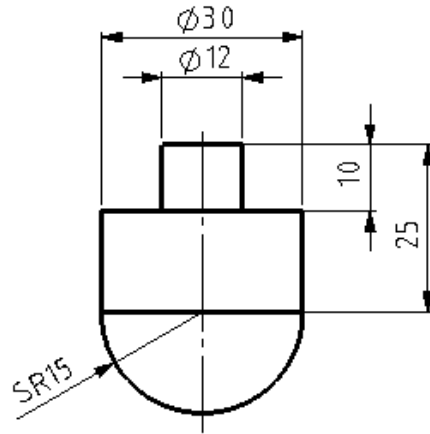
Exercise 2-5



Exercise 2-6



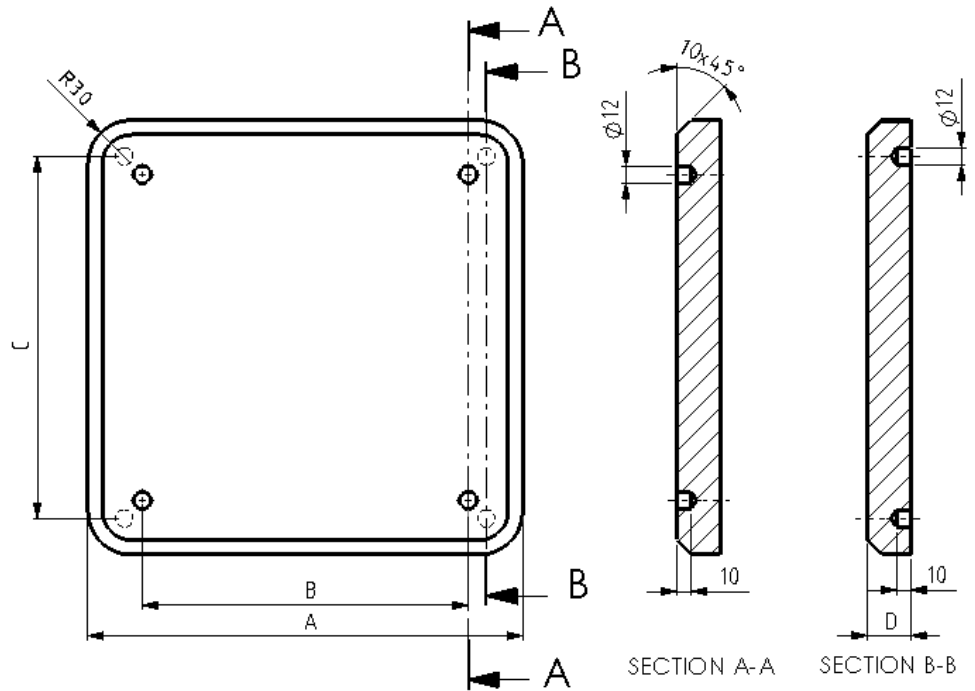
Exercise 2-7



Tutorial 3 Exercises

Exercise 3-1

Based on the model from exercise 2-5, make configurations using the dimensions in the table on the right. Configuration 1 has the same dimensions as the model in exercise 2-5, so 5 new configurations need to be made.

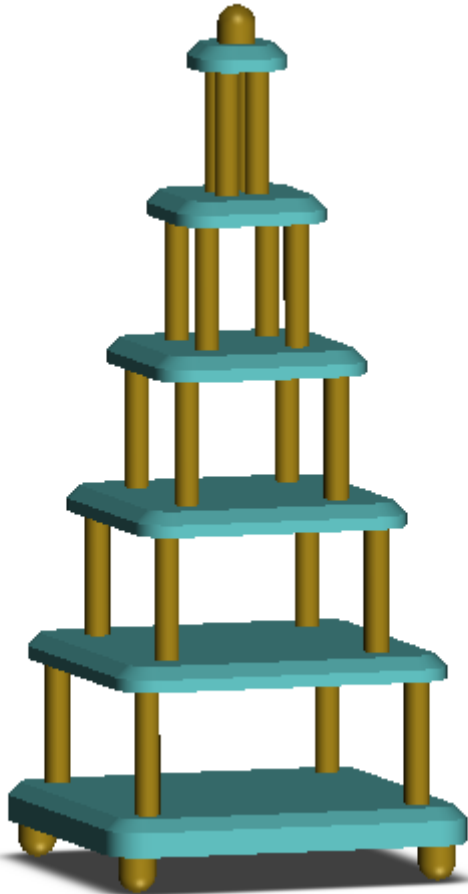


	A	B	C	D
Configuration 1	300	225	250	30
Configuration 2	275	175	225	20
Configuration 3	225	125	175	20
Configuration 4	175	75	125	20
Configuration 5	125	25	75	20
Configuration 6	75	0*	25	20

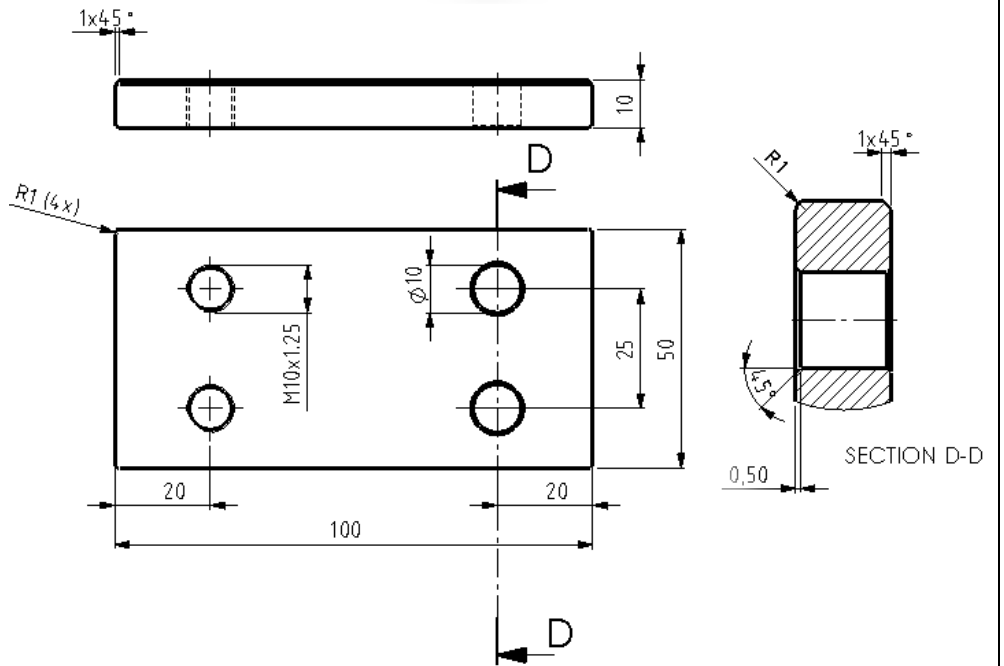
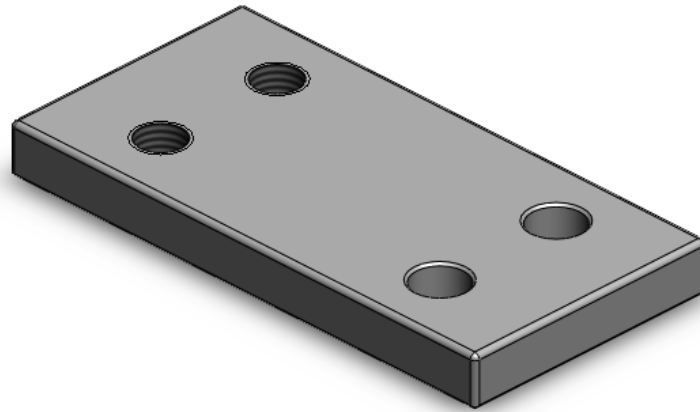
* Configuration 6 has just one single hole in its upper surface, in the middle of the surface.

Exercise 3-2

Put the parts from exercises 2-5 through 3-1 together to produce an assembly as shown on the right. Use different colors for the different parts.

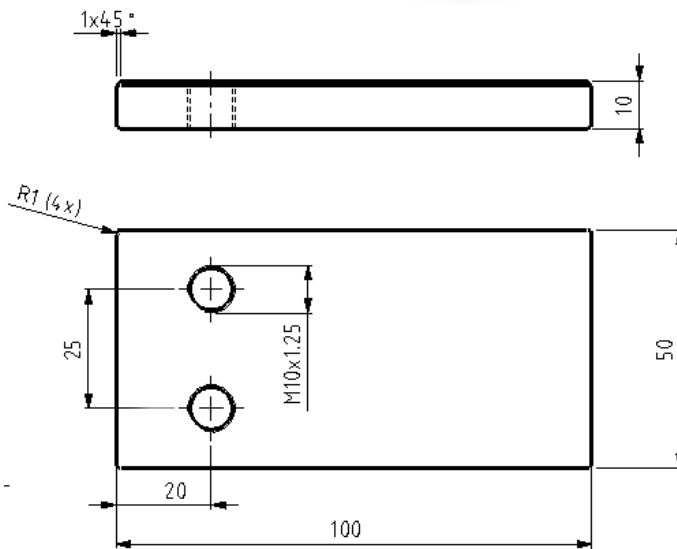
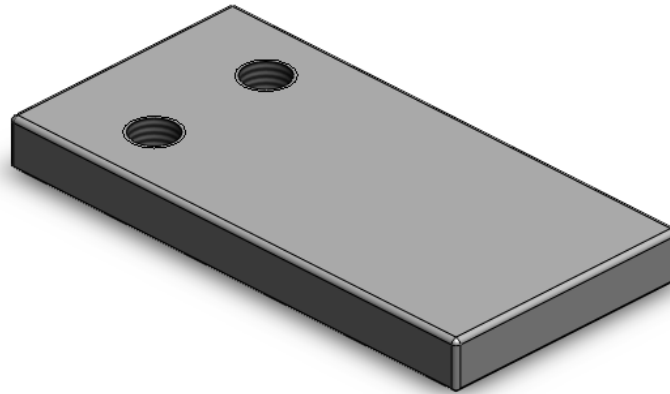


Exercise 3-3



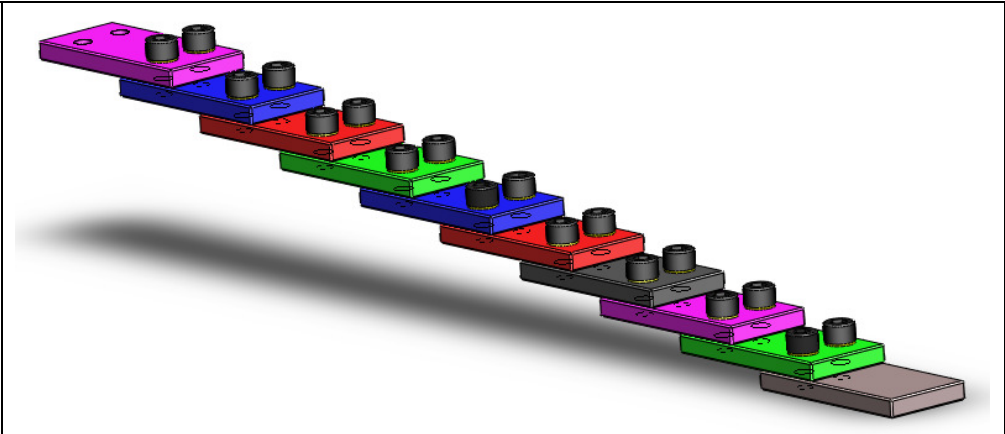
Exercise 3-4

Make a new configuration out of the model from exercise 3-3 as shown on the right. You need to suppress the two holes to make this configuration.

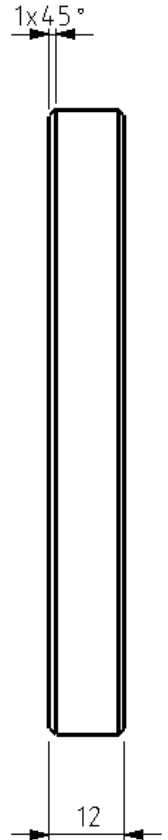
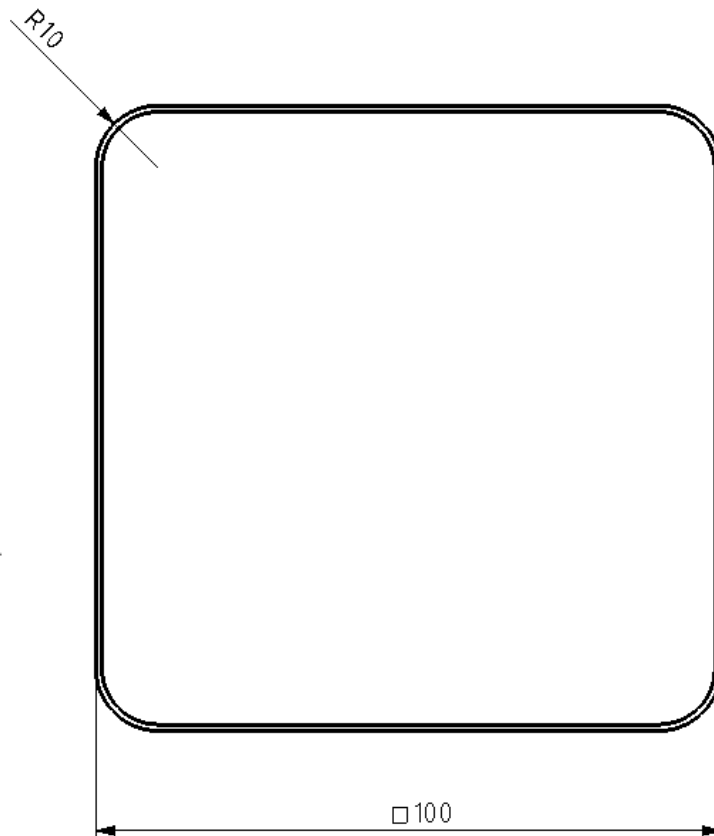


Exercise 3-5

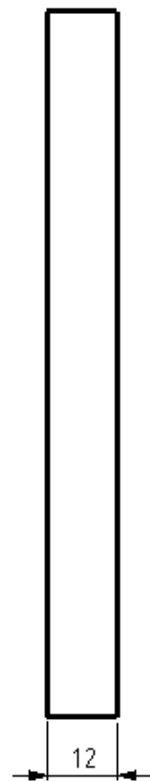
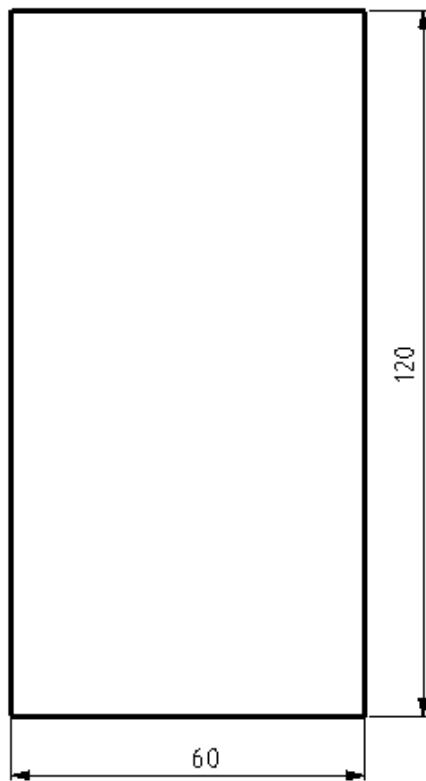
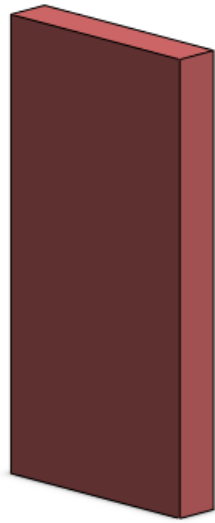
Make an assembly as shown on the right. Use the parts from exercises 3-3 and 3-4. To secure it, use a Hex Socket Head, M12x1.25x20 from the Toolbox. Place a plain washer under each screw.



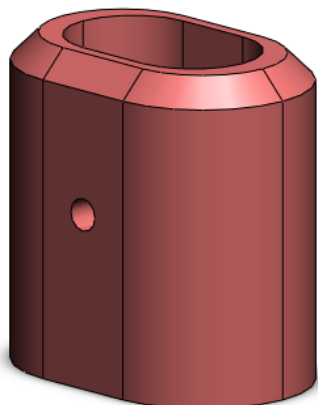
Exercise 3-6

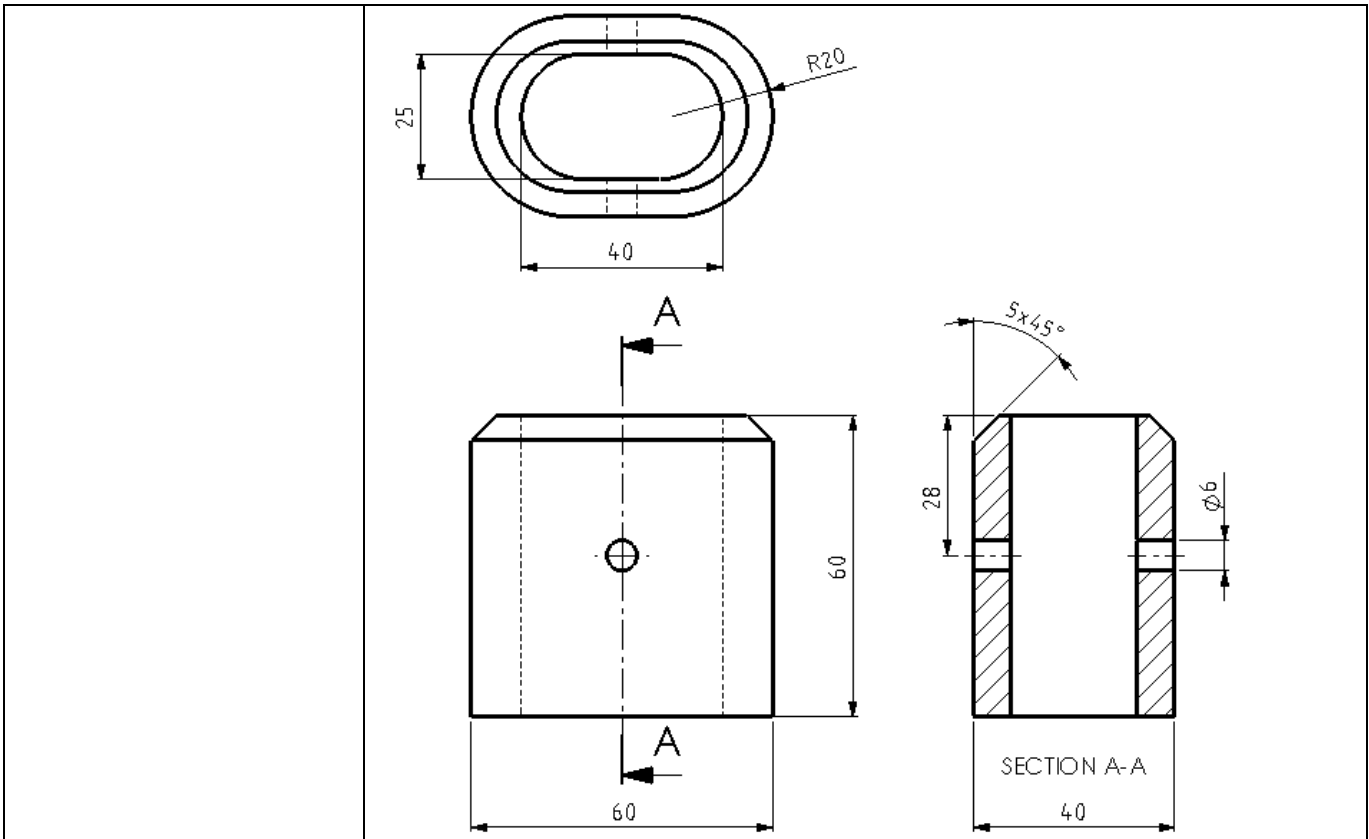


Exercise 3-7



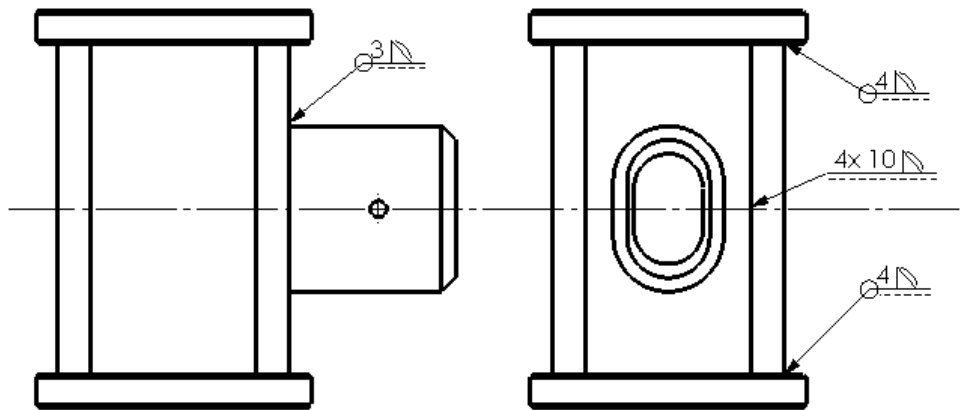
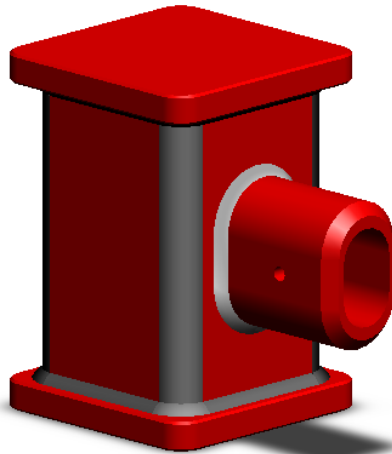
Exercise 3-8





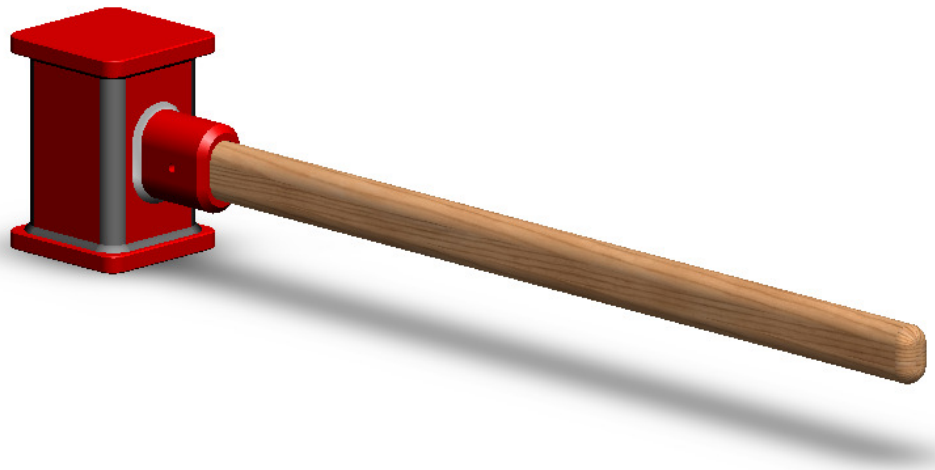
Exercise 3-9

Use the parts from exercises 3-6 through 3-8 to make the assembly. Add fillet welds as shown in the drawing on the right.

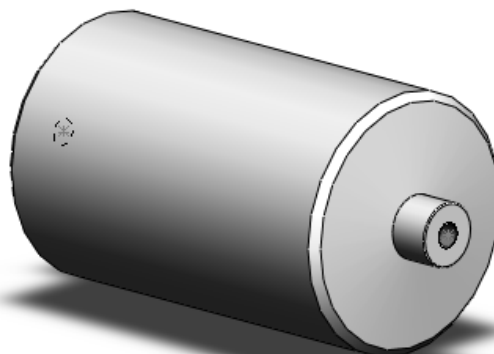


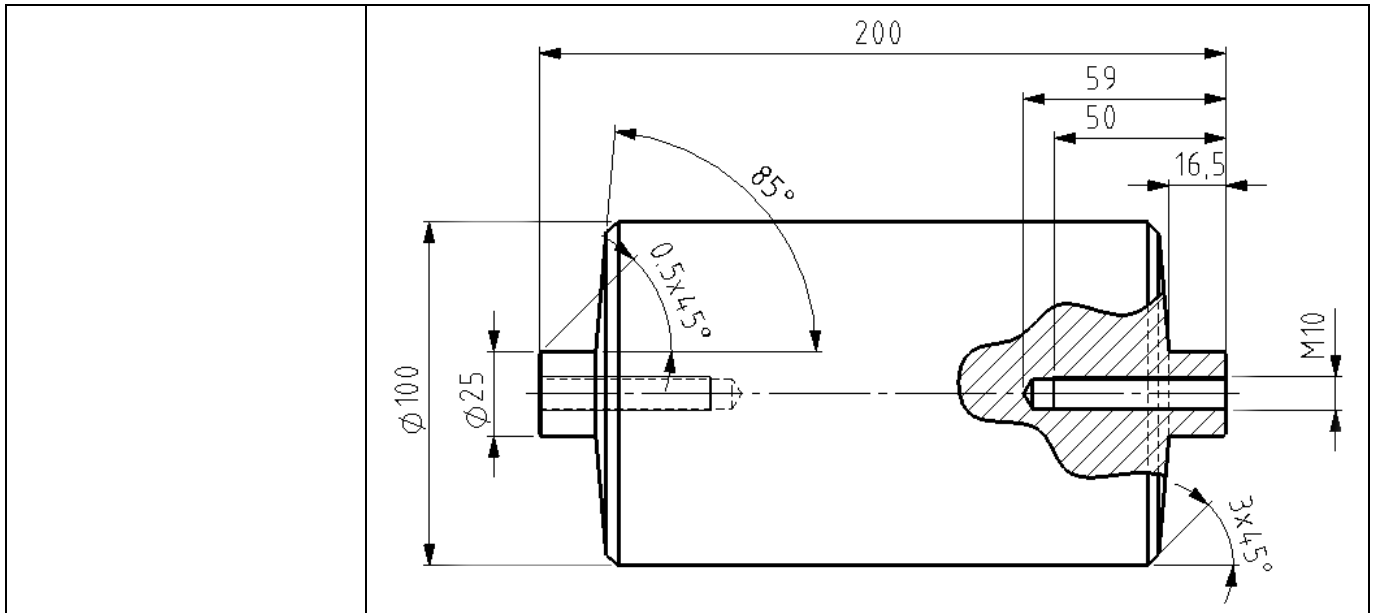
Exercise 3-10

Now make a 700mm long handle and add it to the assembly.

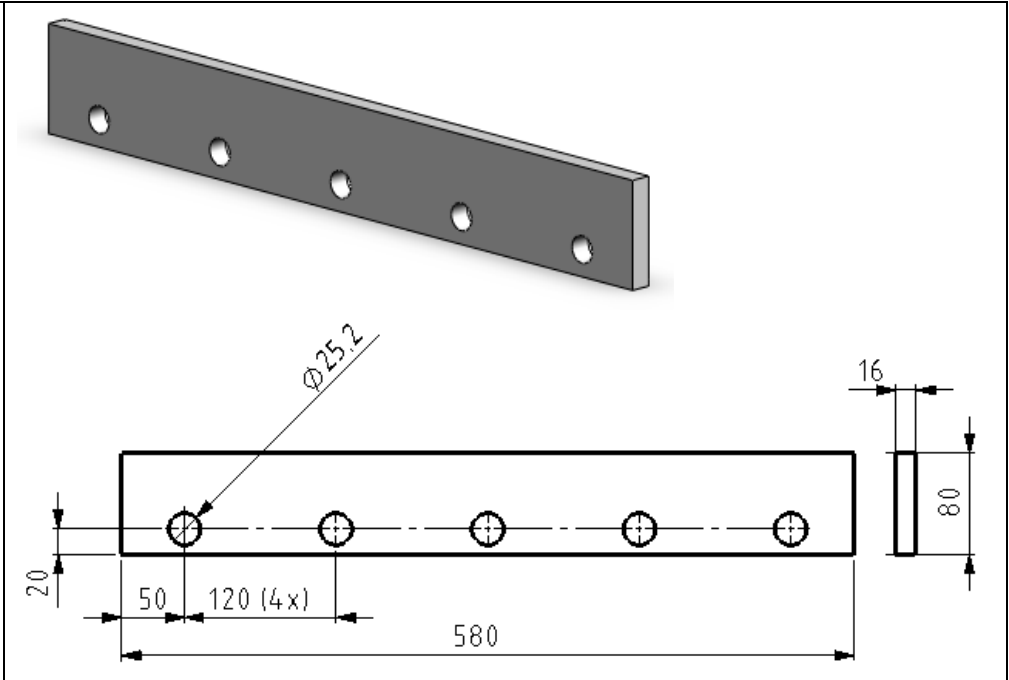


Exercise 3-11

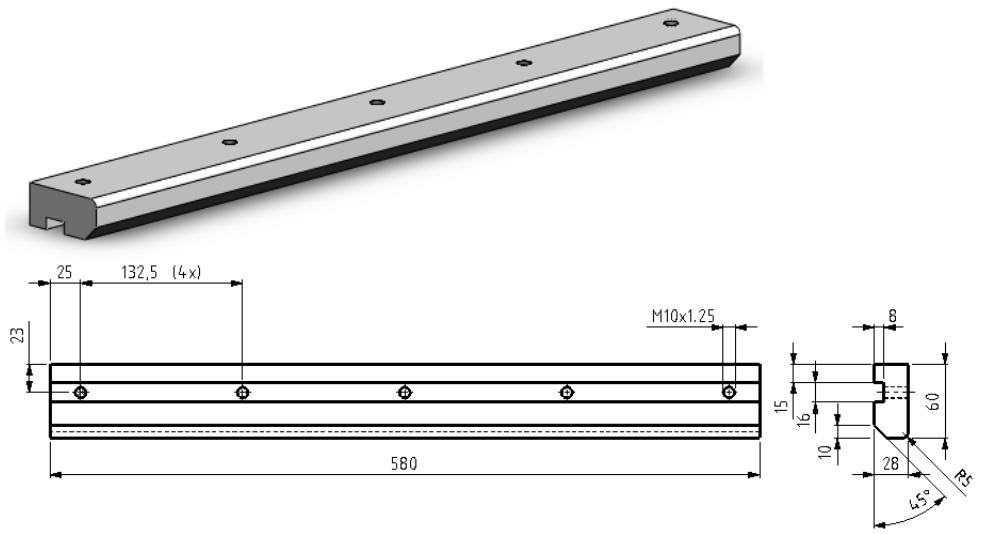




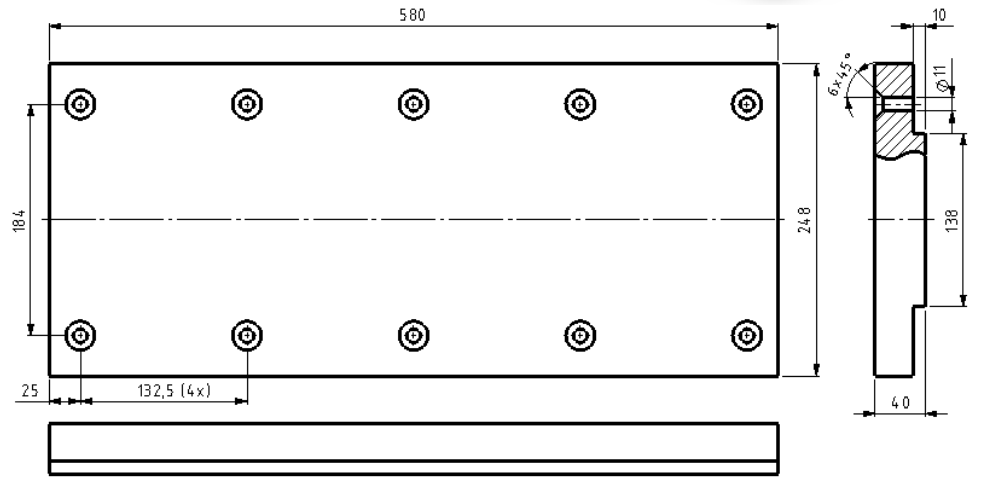
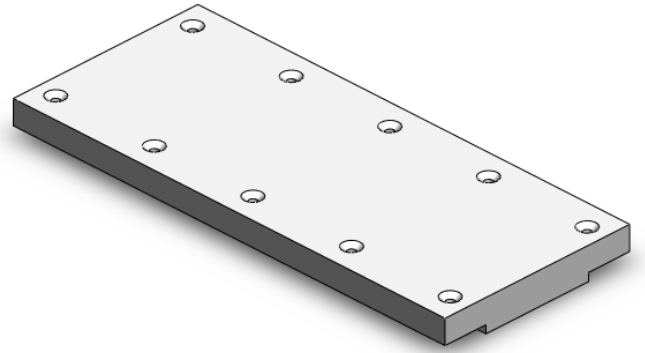
Exercise 3-12



Exercise 3-13



Exercise 3-14



Exercise 3-15

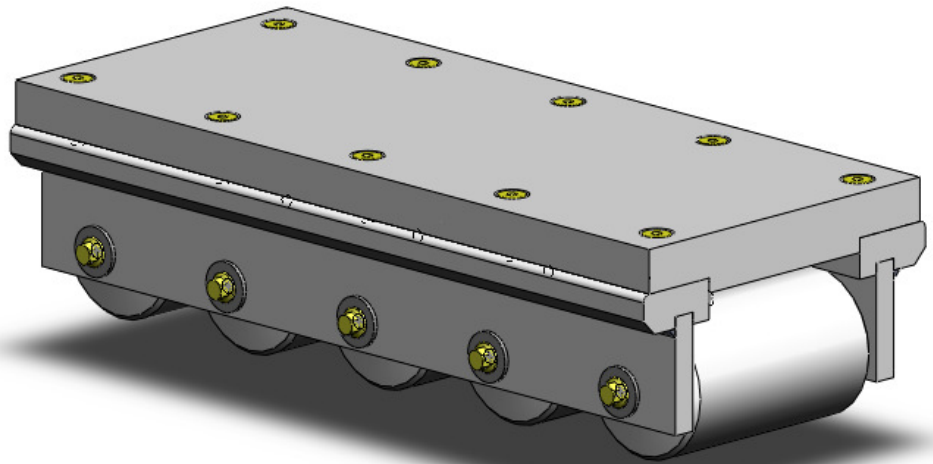
Make the assembly using parts 3-11 through 3-14.

Use 10x Socket Countersunk Head Screw (ISO 10642)

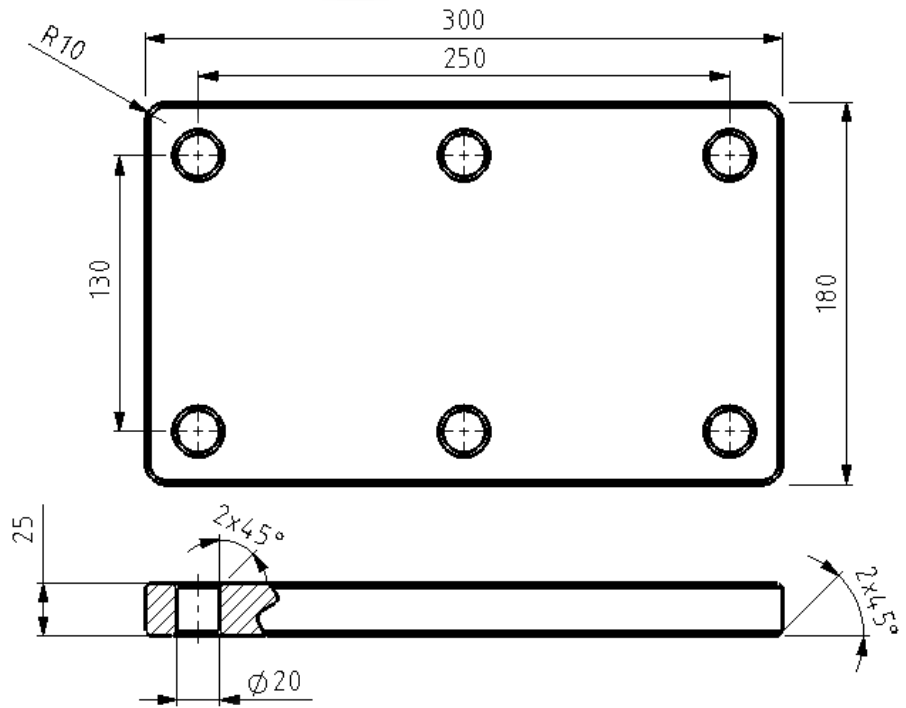
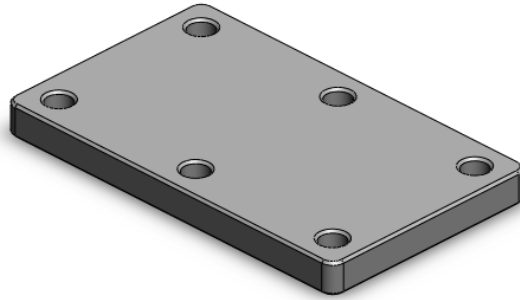
M10x45 to attach strip 3-13 to top plate 3-14.

Weld strip 3-12 to strip 3-13 using a fillet weld over the full length.

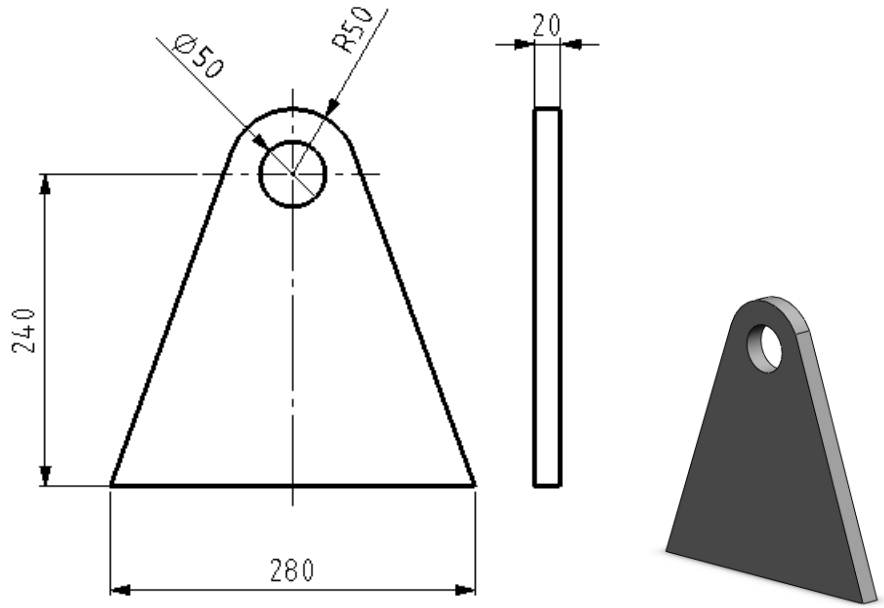
Use hex head screws M10x30 and an extra large plain washer to secure the rollers (3-11).



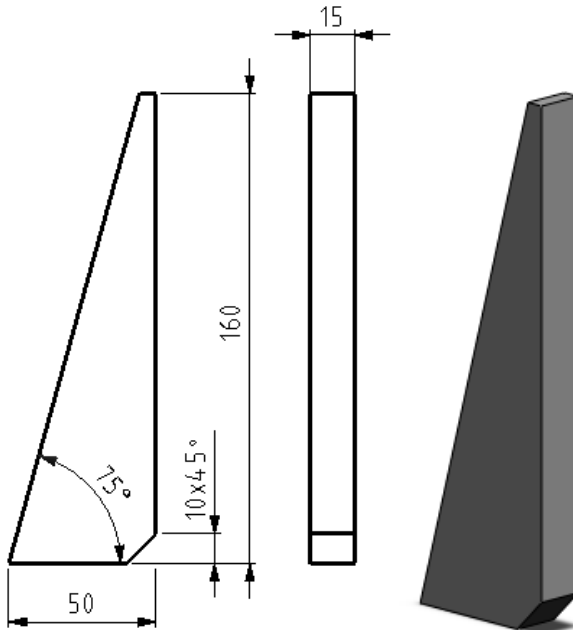
Exercise 3-16



Exercise 3-17

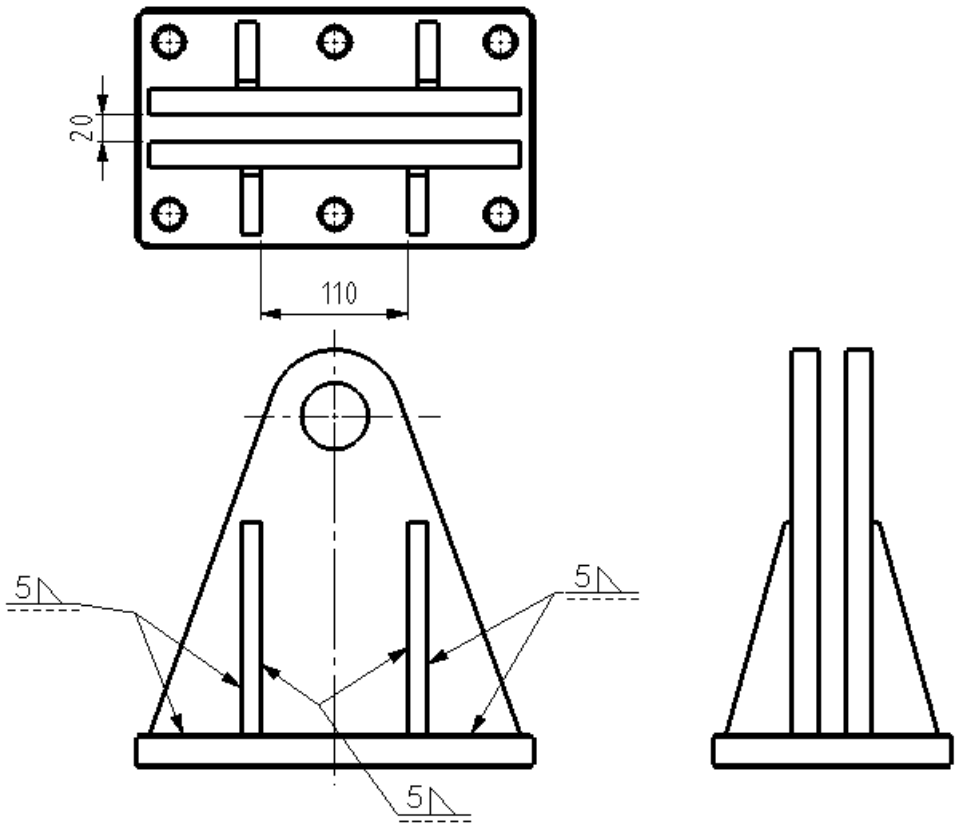
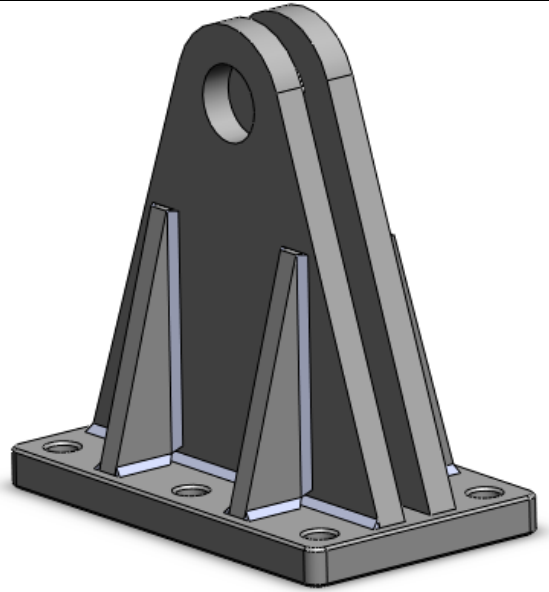


Exercise 3-18



Exercise 3-19

Make a welded assembly out of parts 3-16 through 3-18 as shown in the drawing on the right. Apply the welds as shown in the assembly drawing.



Exercise 3-20

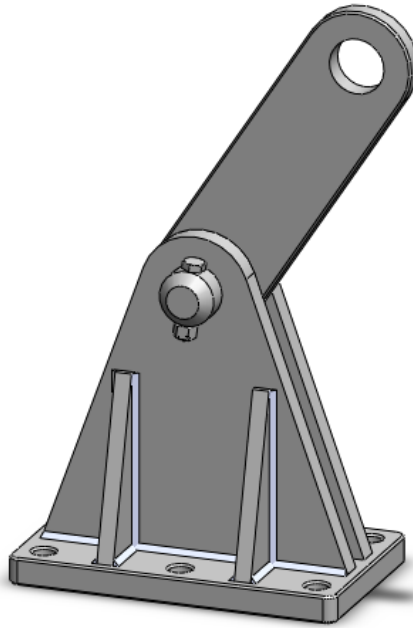
Technical drawing of a vertical link. The front view shows a total width of 100 and a height of 255. Two circular holes are positioned vertically, each with a diameter of $\varnothing 50$. The top corners are chamfered with a $2 \times 45^\circ$ angle. A side view shows a thickness of 20. A 3D perspective view of the link is shown to the right.

Exercise 3-21

Technical drawing of a cylindrical pin. The front view shows a total length of 120 and a central diameter of $\varnothing 12$. The ends are chamfered with a 45° angle. The chamfered section has a length of 90 and a chamfer width of 10. The end view shows an outer diameter of $\varnothing 80$, an inner diameter of $\varnothing 50$, and a central hole with a diameter of $\varnothing 30$. A 3D perspective view of the pin is shown at the bottom right.

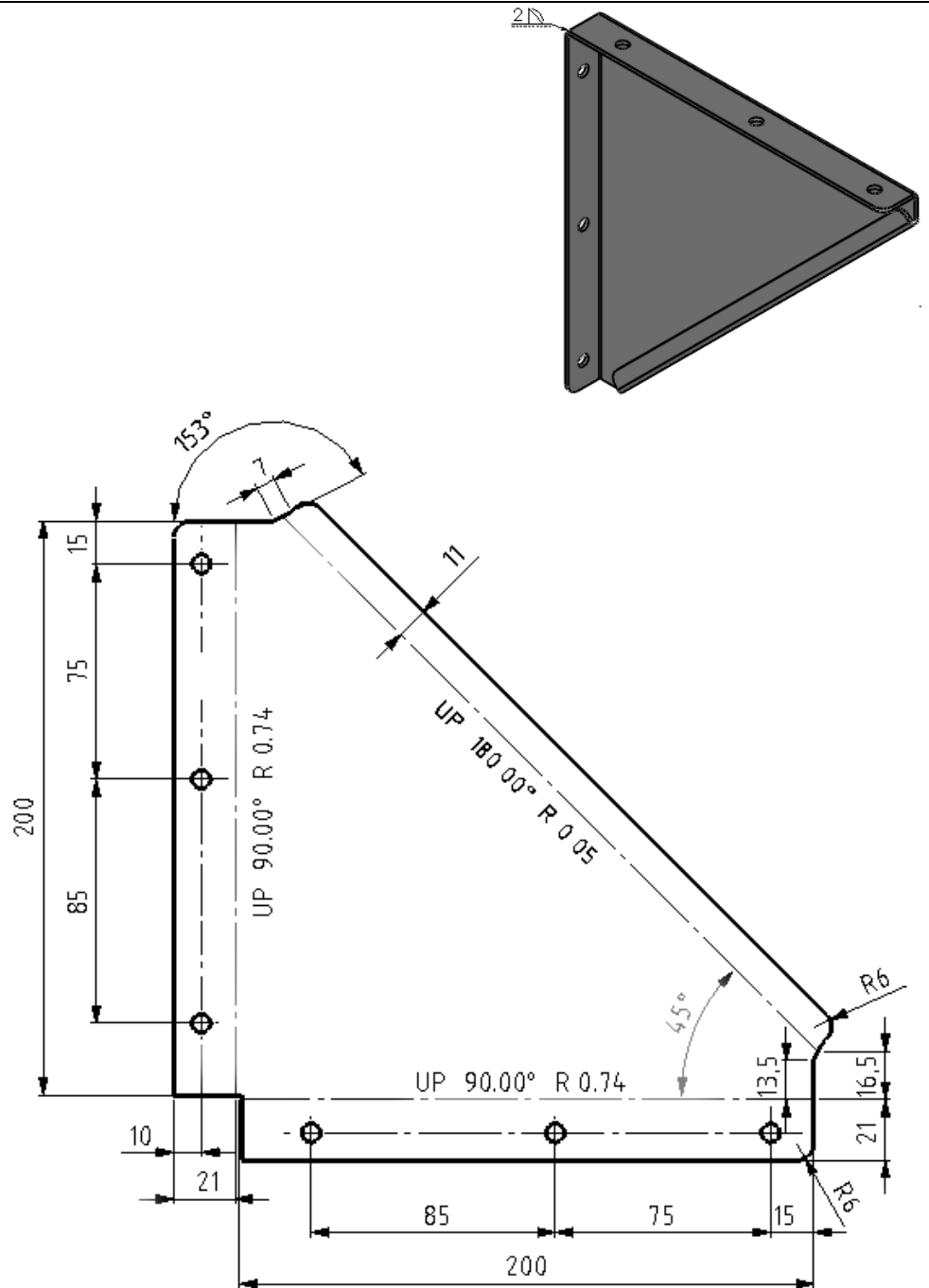
Exercise 3-22

Make an assembly out of parts 3-19 through 3-21. Use a hex head screw (ISO 4014) M12x65 and a hex nut (ISO 4034) to secure the pin.

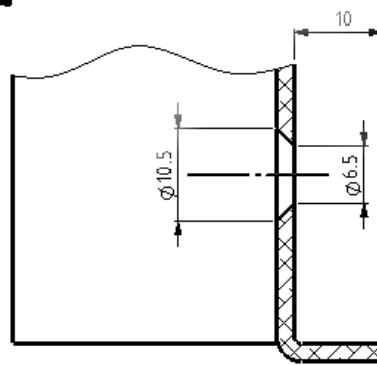
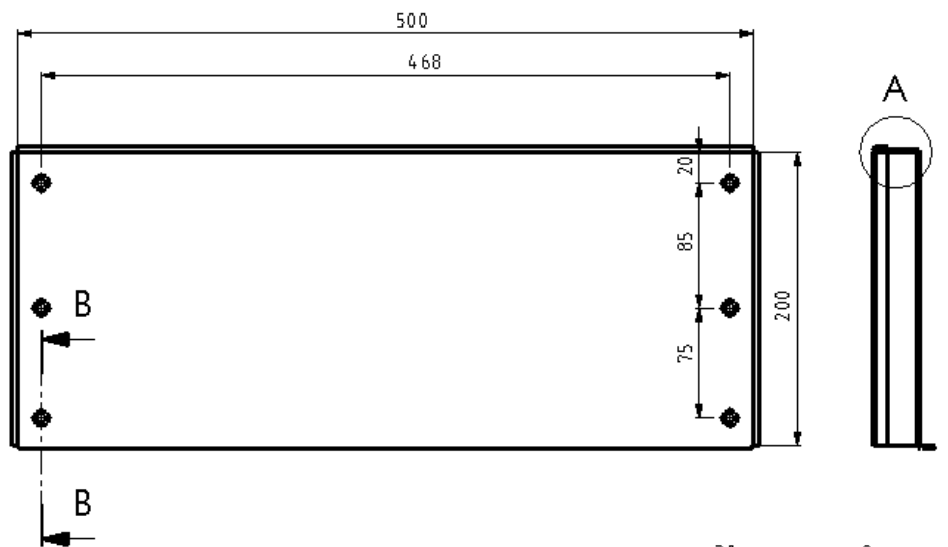
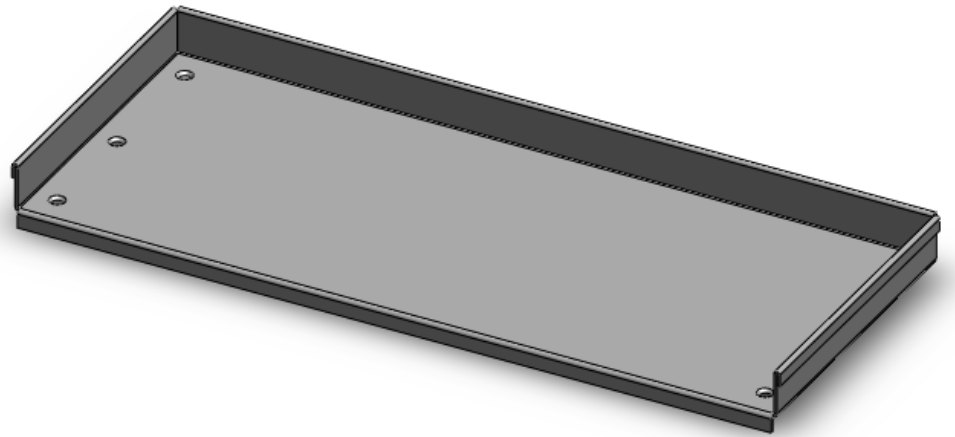


Tutorial 4 Exercises

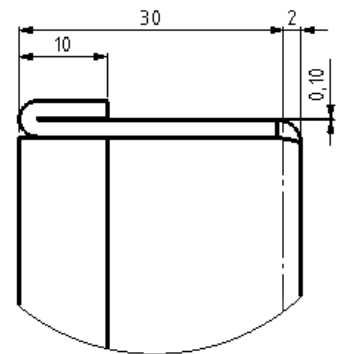
Exercise 4-1



Exercise 4-2

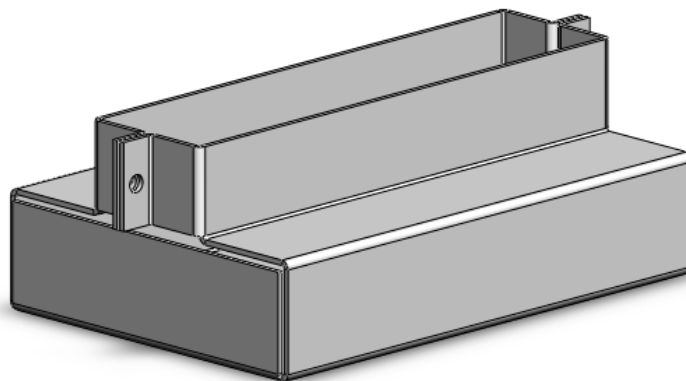


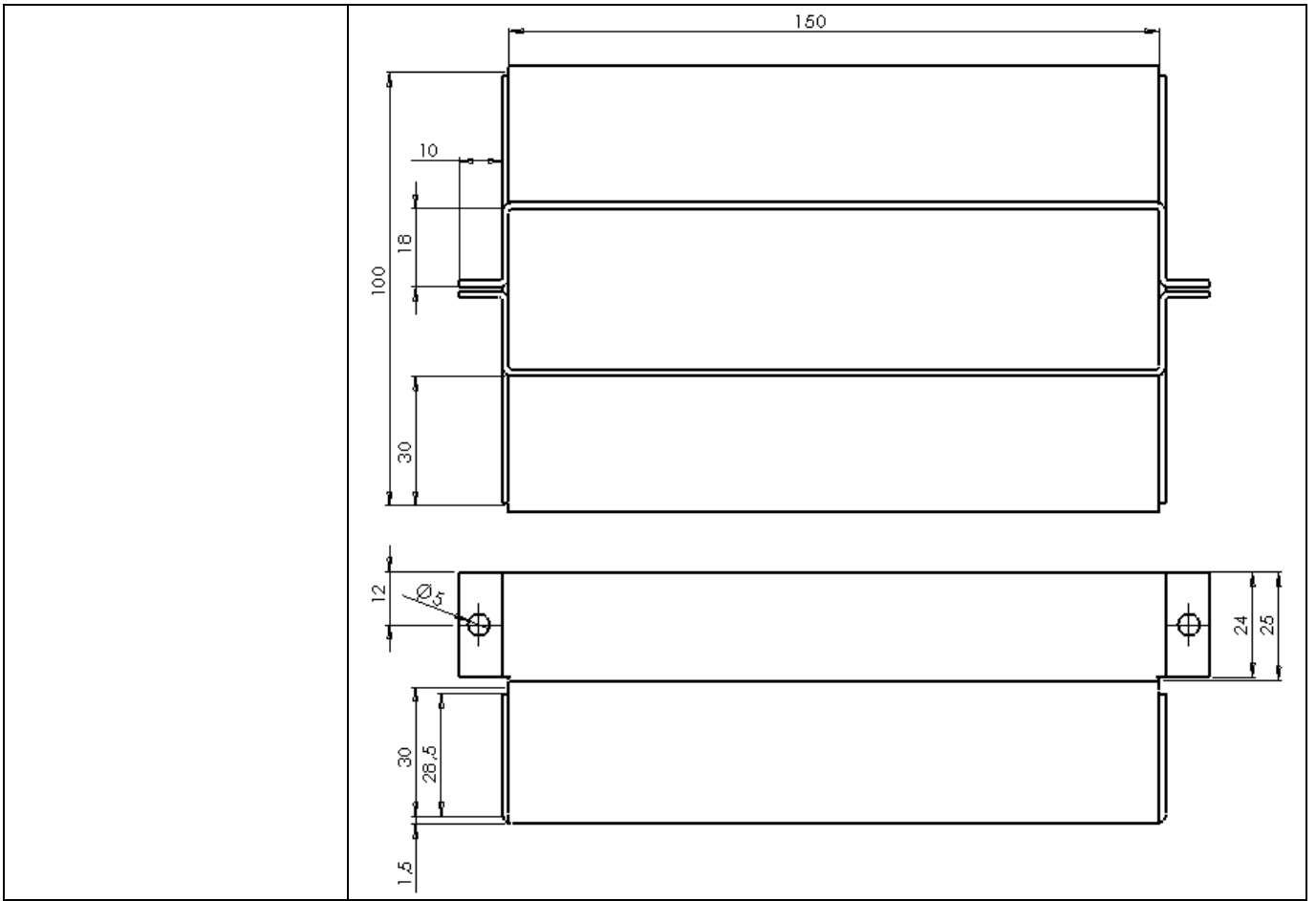
SECTION B-B
SCALE 2 : 1



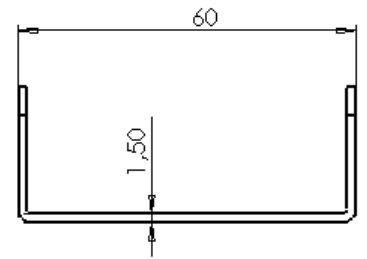
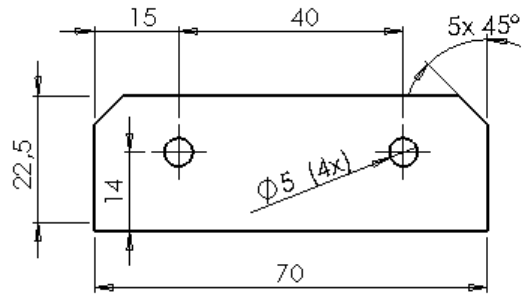
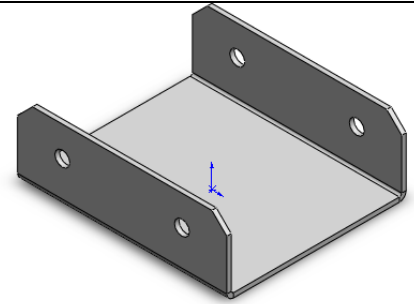
DETAIL A
SCALE 2 : 1

Exercise 4-3

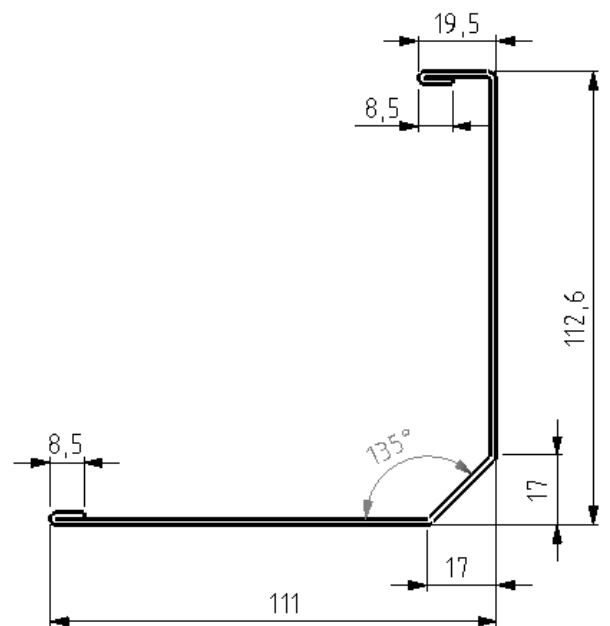
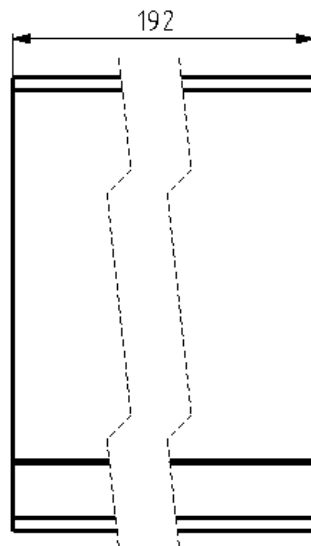
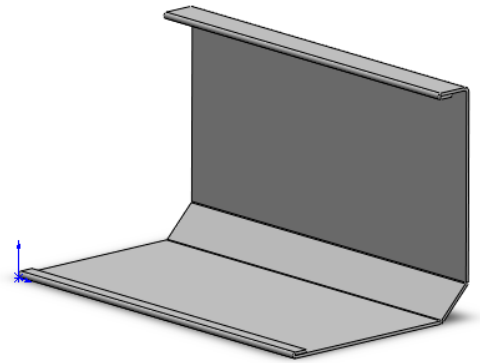




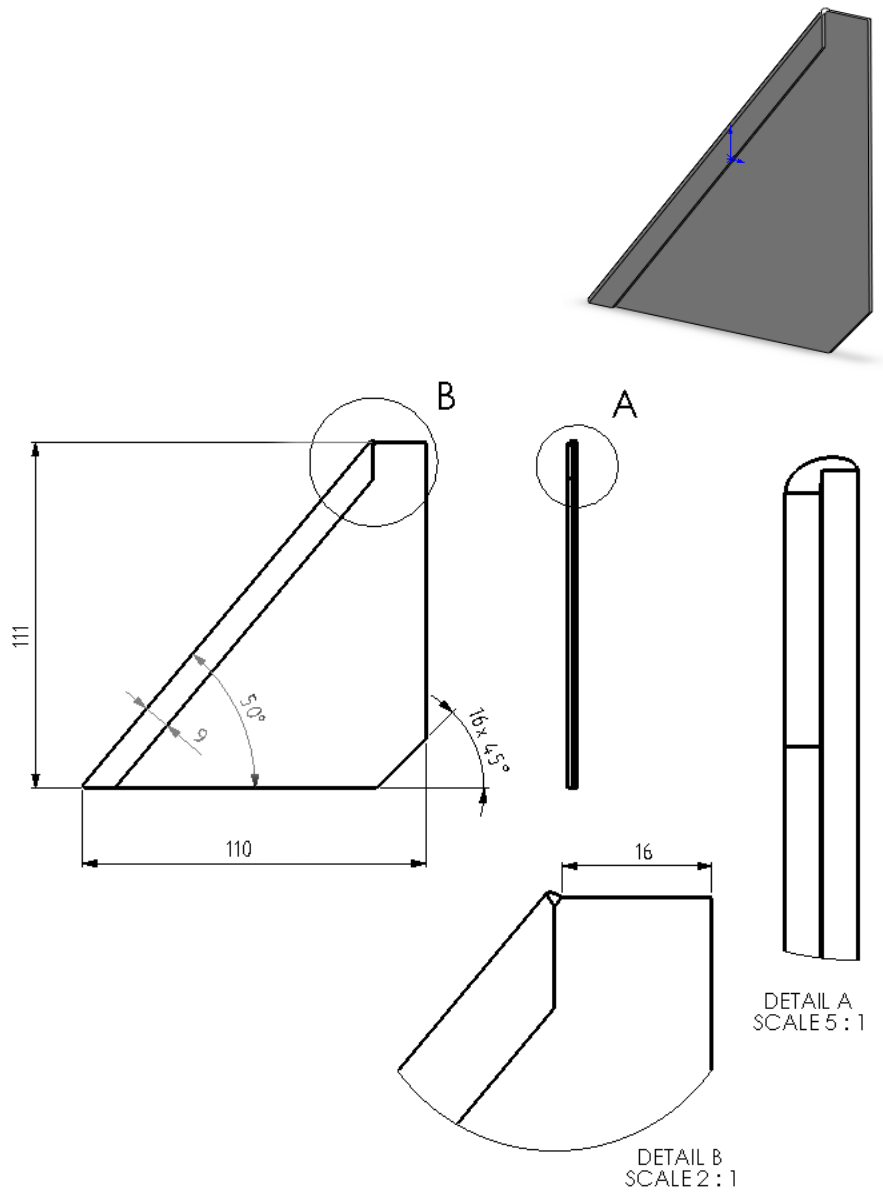
Exercise 4-4



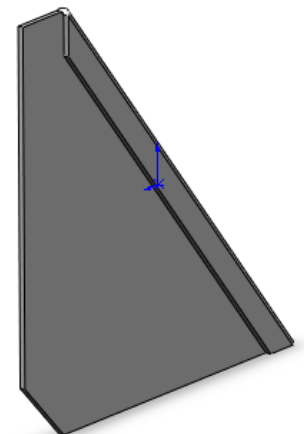
Exercise 4-5



Exercise 4-6a

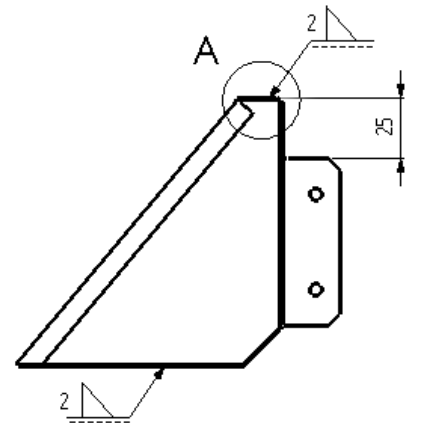
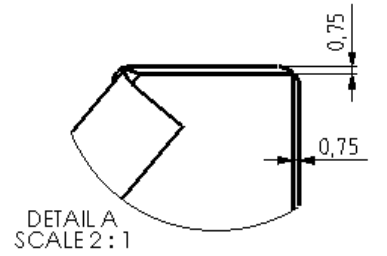
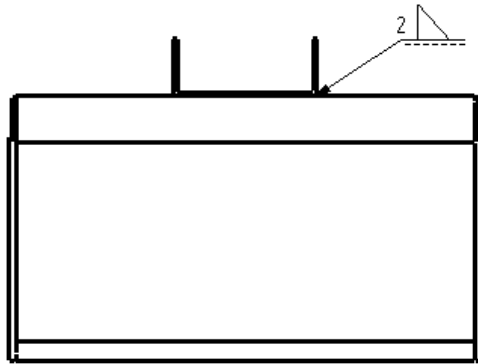
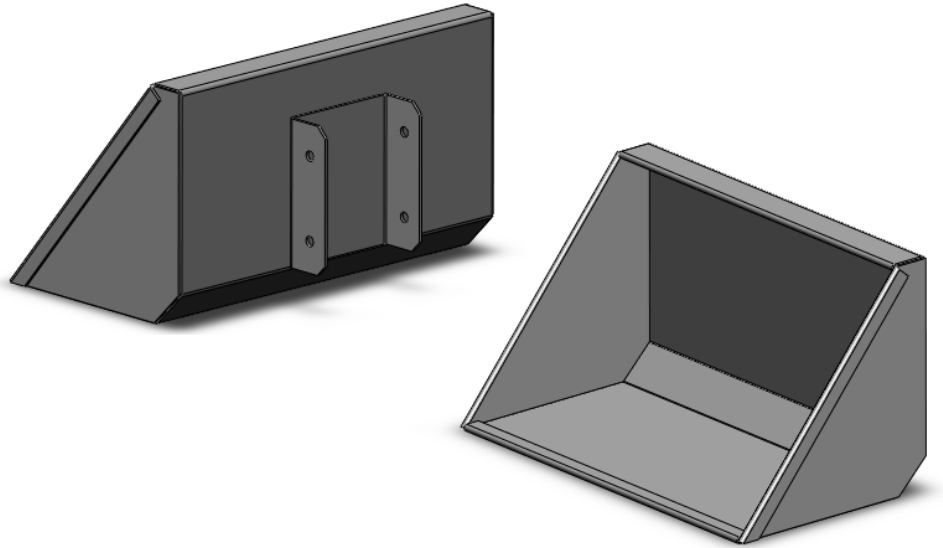


Exercise 4-6b
Make a mirror image version of part 6a. The folded edge is now on the other side.



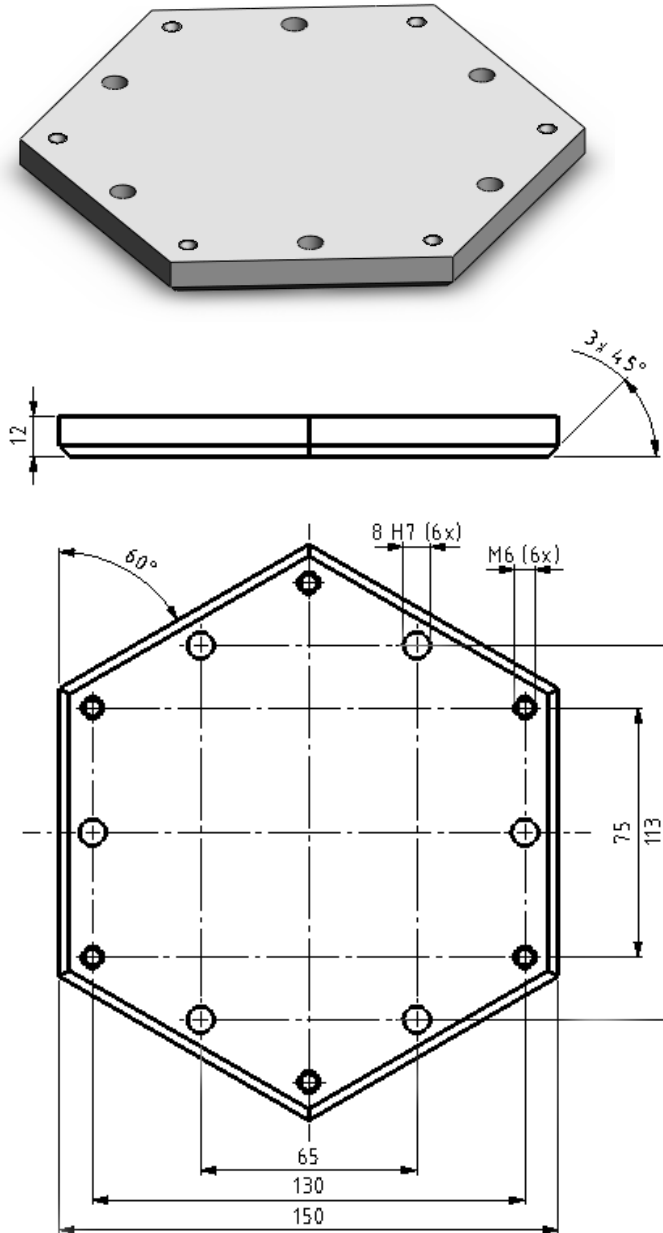
Exercise 4-7

Use parts 4-4, 4-5, 4-6a and 4-6b to construct the assembly as shown on the right.

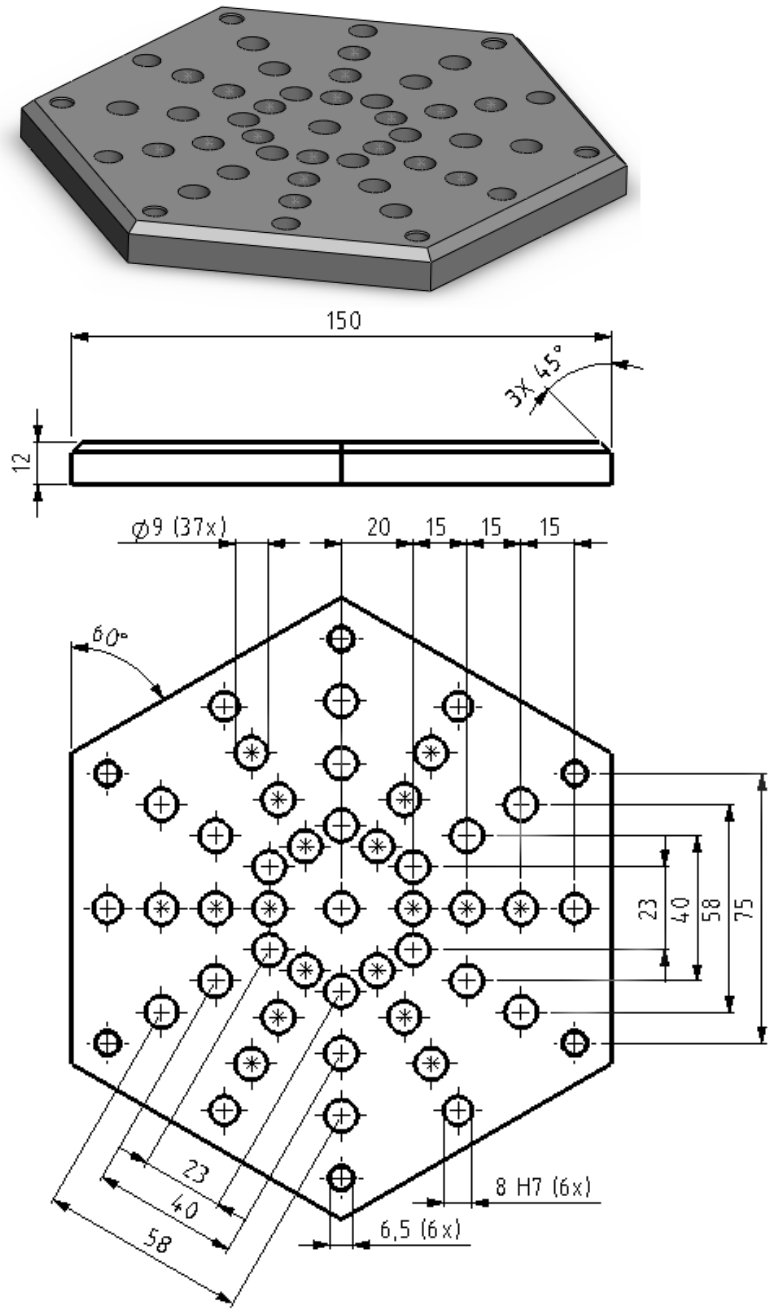


Tutorial 5 Exercises

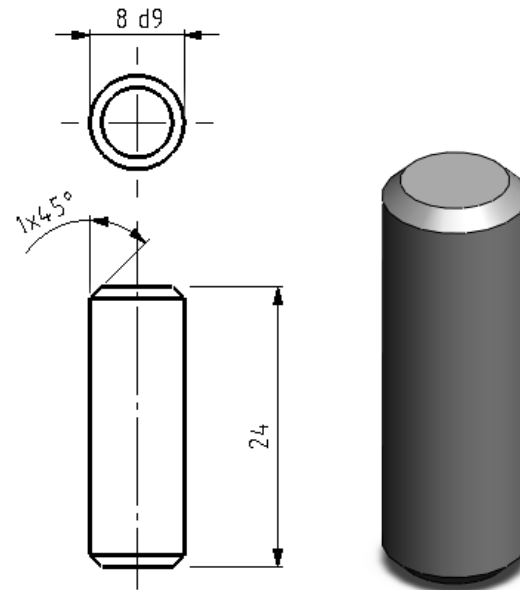
Exercise 5-1



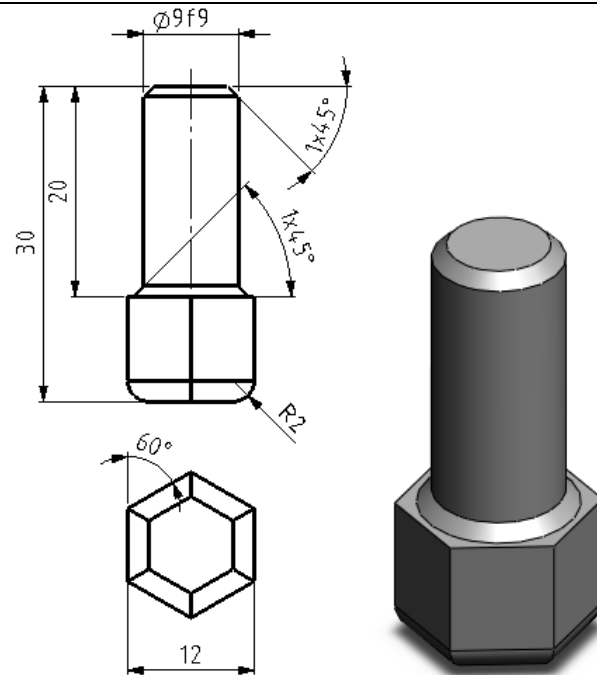
Exercise 5-2



Exercise 5-3



Exercise 5-4



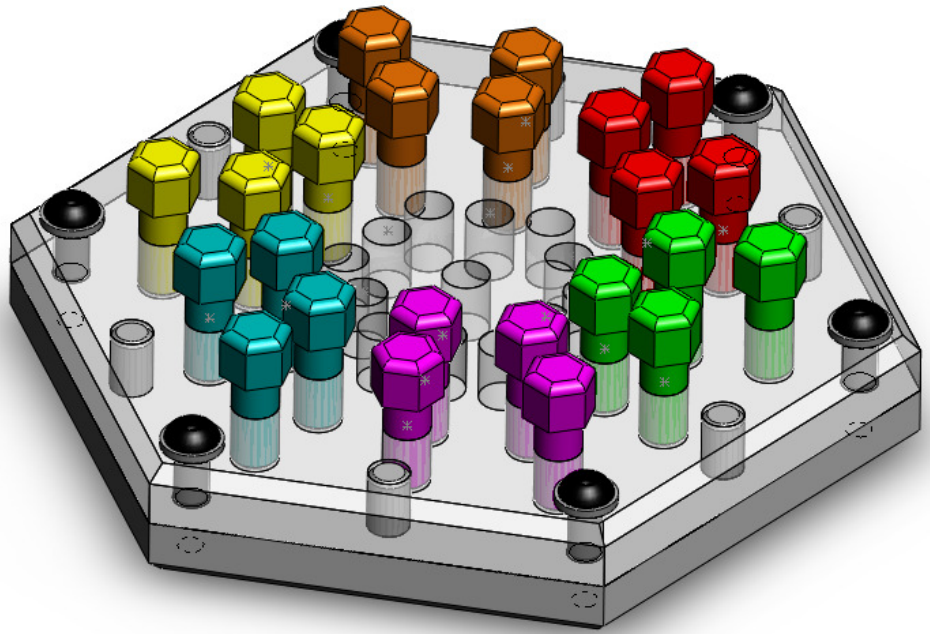
Exercise 5-5

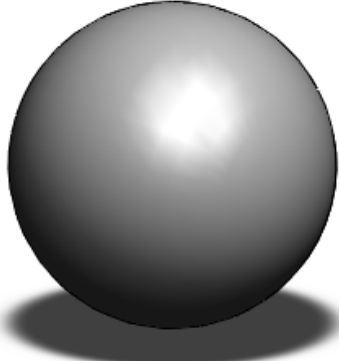
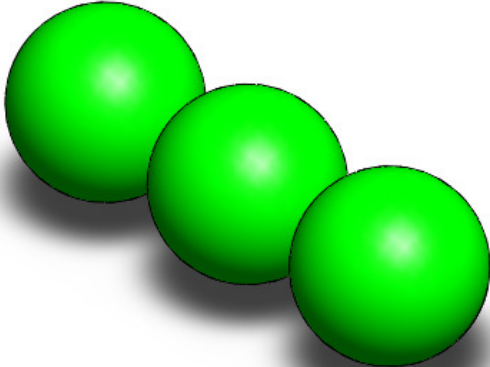
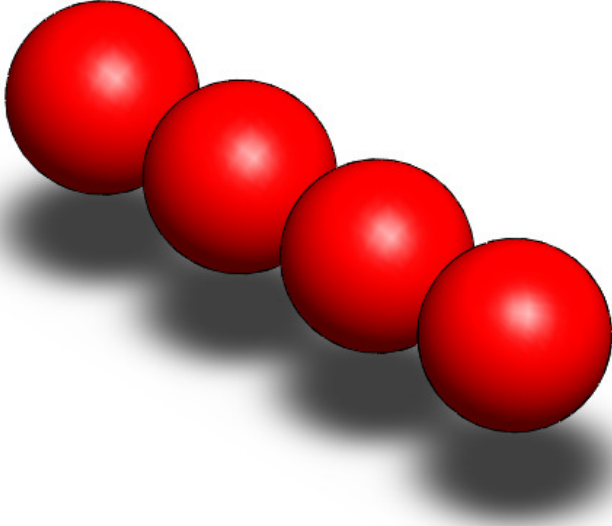
Make an assembly using parts 5-1 through 5-4 as shown on the right.

The two plates are positioned with dowel pins (5-3) and then secured using:

- Plain washer, Normal Grade A, ISO 7089-6 (M6)
- Socket Button Head Screw, ISO 7380 – M6x25

You will find both parts in the Toolbox.



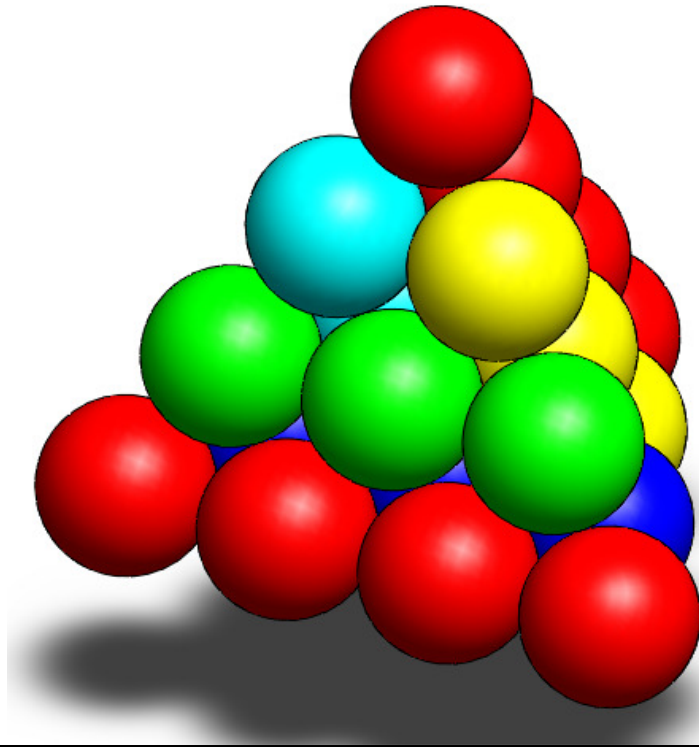
<p>Exercise 5-6a Model a sphere with a diameter of 60mm.</p>	
<p>Exercise 5-6b Make an assembly using the sphere from exercise 5-6a three times. The spheres should all sit in a row and touch each other.</p>	
<p>Exercise 5-6c Make an assembly using the sphere from exercise 5-6a four times. The spheres should all sit in a row and touch each other.</p>	

Exercise 5-7

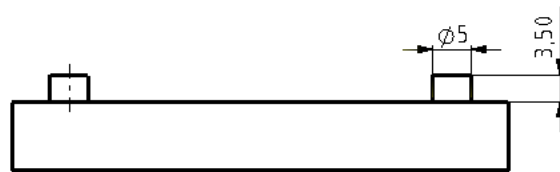
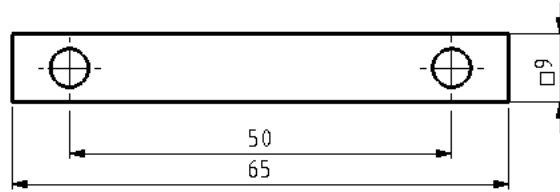
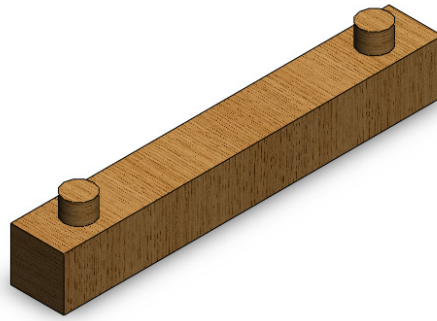
Make the assembly shown on the right. Use:

- 4 x assembly 5-6b
- 2 x assembly 5-6c

A different color is used for each occurrence of assembly 5-6b in the image on the right.

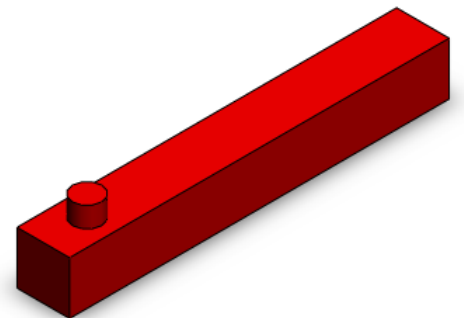


Exercise 5-8



Exercise 5-9

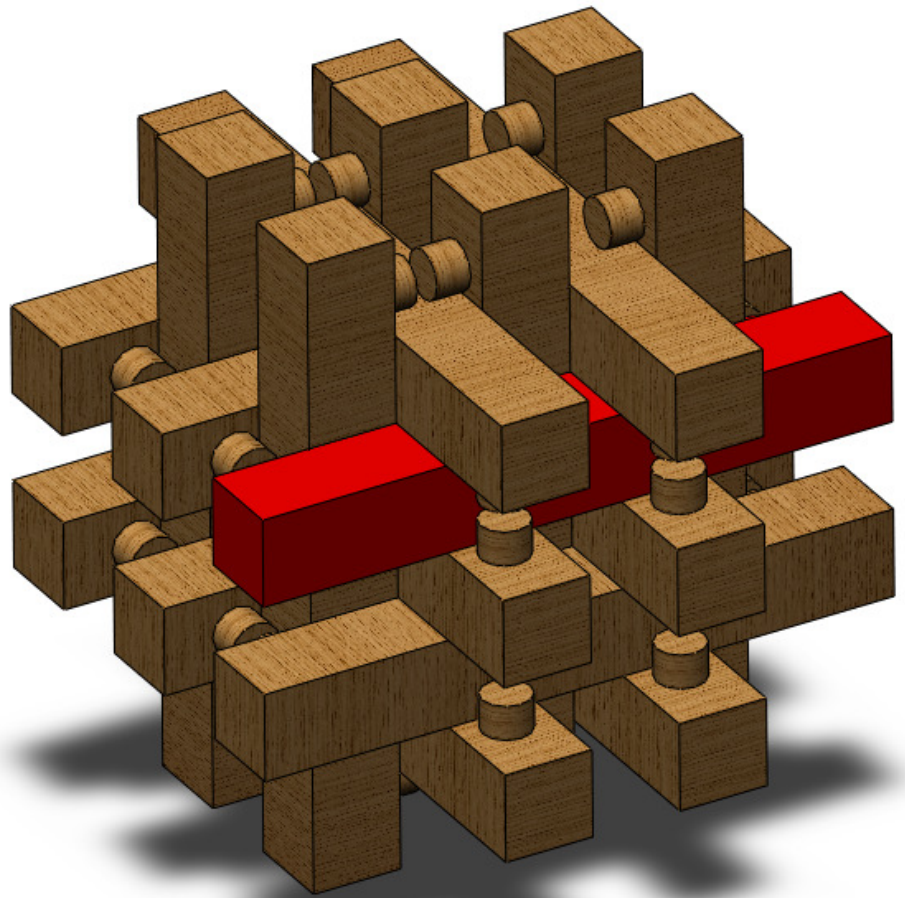
Make a new configuration for exercise 5-8 with just one pin.

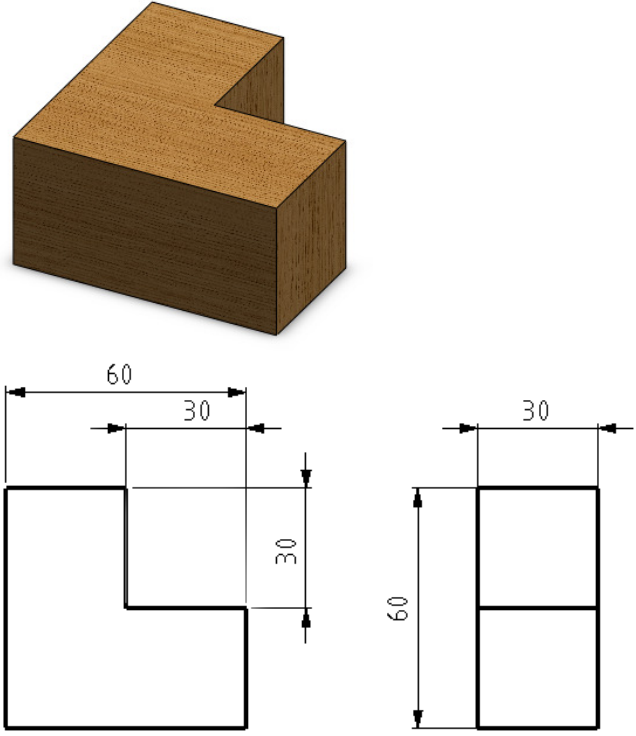
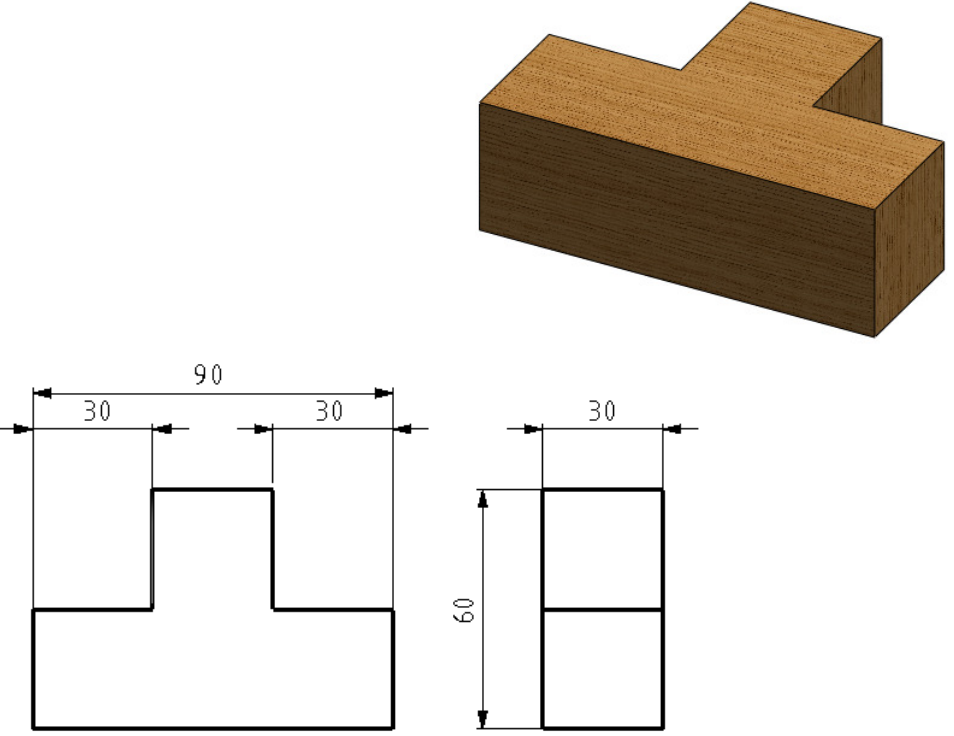
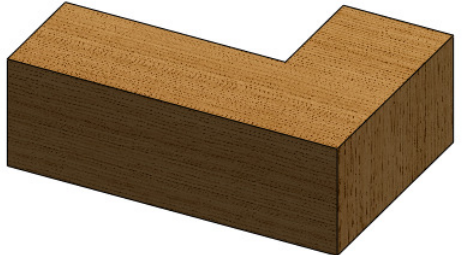


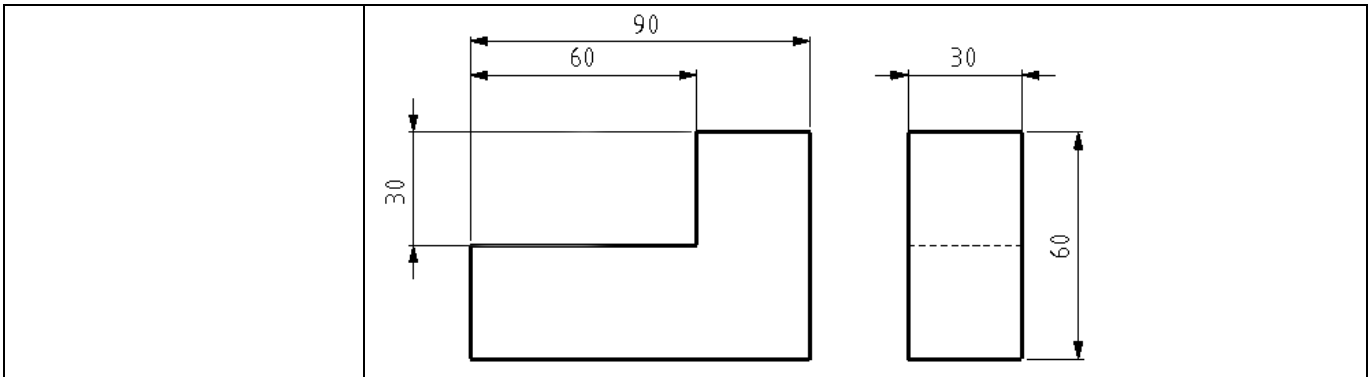
Exercise 5-10

Make the assembly. Use:

- 17 x exercise 5-8
- 1 x exercise 5-9



<p>Exercise 5-11</p>	
<p>Exercise 5-12</p>	
<p>Exercise 5-13</p>	



Exercise 5-14

3D perspective view of a stepped block. The block is shown in a brown, wood-like texture. It has a main rectangular body with a width of 90 and a height of 60. A smaller rectangular block with a width of 30 and a height of 30 is attached to the top left corner of the main block.

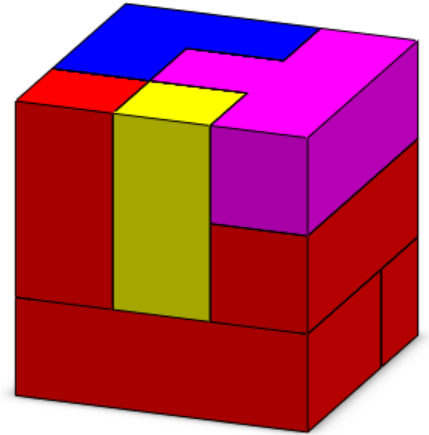
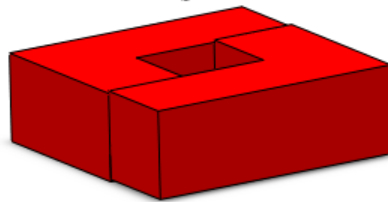
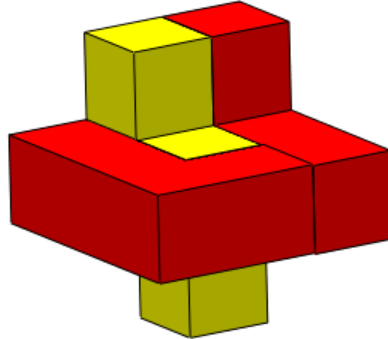
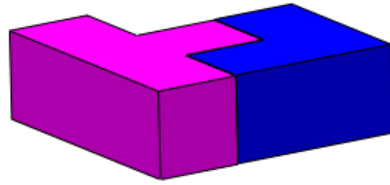
Orthographic projections of the 3D block. The front view shows a main rectangular block with a total width of 90 and a height of 60. A smaller rectangular block with a width of 30 and a height of 30 is attached to the top left corner of the main block. The side view shows a rectangular block with a width of 30 and a height of 60.

Exercise 5-15

Make the assembly as shown on the right. Use:

- 1 x exercise 5-11
- 1 x exercise 5-12
- 4 x exercise 5-13
- 1 x exercise 5-14

For the sake of clarity, a different color has been used for the various components shown on the right.



SolidWorks is active in education

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In the Benelux countries, SolidWorks is the most popular 3D CAD software on the market. This is thanks to a unique combination of characteristics: great ease of use, wide usability and outstanding support. User requirements are always included in the software in the annual updates, which leads to an annual extension of functionality, but also to optimization of existing functions in the software.

Education

A large number of educational organizations, ranging from organizations for secondary technical education to technical universities, have already chosen SolidWorks. Why?

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