ENGINEERING DRAWINGS
MENG 102

CLASSWORK SHEETS

Department of Mechanical Engineering
Faculty of Engineering
King Abdulaziz University
Jeddah, Kingdom of Saudi Arabia

FALL 2015
Sketch Entities: Line, Rectangle, Circle, Ellipse, Polygon, Slot.
Sketch Tools: Fillet, Chamfer, Relation (tangent, horizontal, perpendicular, equal), Smart dimension
Feature: Problems1: Draw the following sketches then extrude it with thickness of 10mm

1. [Rectangle]
2. [Triangle]
3. [Right triangle]
4. [Square]
5. [Isosceles triangle]
6. [Rectangle]
7. [Square]
8. [Rectangle]
9. [Circle]
10. [Quarter circle]
11. [Rounded rectangle]
12. [Rounded rectangle]
13. [Quarter circle]
14. [Octagon]
15. [Octagon]
16. [Equilateral triangle]
17. [Oval]
18. [Oval]
19. [Cylindrical object]
Sketch Entities: Line, Centerline, Rectangle, Circle
Sketch Tools: Fillet, Trim, Relation (tangent, horizontal, perpendicular, equal), Smart dimension
Feature: Extrude

Problems 1: Draw the following sketches then extrude it with thickness of 10mm

CLASSWORK

HOMEWORK

Simple
### Sketch Entities
- Polygon, Arc, Slot.

### Sketch Tools
- Chamfer, Extend, Construction geometry, Mirror, Linear pattern, Circular pattern, Offset.

### Feature
- Extrude

### Problems 1
*Draw the following sketches then extrude it with thickness of 10mm*

### CLASSWORK

1. **(1)**
   - Sketch with dimensions:
     - Lengths: 100, 120, 25, 24, 50, 40, 160, 50, 40, 50, 10, 10, 30°
     - Radii: R20, R15, R10, R50

2. **(2)**
   - Sketch with dimensions:
     - Lengths: 110, 80, 77, 50, 50, 15, 30°
     - Radii: R25, R30, R210, R35.5

3. **(3)**
   - Gears design with dimensions:
     - At 30°: R80, R16, R15, R30
     - Centerline: R50

4. **(4)**
   - Gears design with dimensions:
     - At 30°: R80, R16, R15, R30
     - Centerline: R50
Simple
Problems1: Draw the following parts

(1) (2) (3) (4)
. Simple

(5) (6)

(7) (8)

(9) (10)
-Challenging
Classes Entities:

Sketch Tools: convert entries, offset

Feature: Rib, Reference geometry, Mirror feature, Contour Selection.

Problems 1: Draw the following parts with the same dimension.

### CLASSWORK

<table>
<thead>
<tr>
<th>Problem</th>
<th>Sketch</th>
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</thead>
<tbody>
<tr>
<td>(1)</td>
<td><img src="image1" alt="Sketch 1" /></td>
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<tr>
<td>(2)</td>
<td><img src="image2" alt="Sketch 2" /></td>
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<tr>
<td>(3)</td>
<td><img src="image3" alt="Sketch 3" /></td>
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<tr>
<td>(4)</td>
<td><img src="image4" alt="Sketch 4" /></td>
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</tbody>
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K.A.U  
Mechanical Engineering Dept.  
**CLASSWORK #4**  

**Sketch Entities:**
- Convert entries, offset
- Rib, Reference geometry, Mirror feature, Contour Selection.

**Problems 1:**
- Draw the following parts with the same dimension.
HOMEWORK

-Simple-
-Challenging
Problems: Make a drawing sheet for the following 3D models with fully dimension.

(1)

(2)
HOMEWORK

Simple

(5)

(6)
Problem 1: Make a drawing sheet for the following 3D model with fully dimension.
SECTION BY-BY

- Challenging
Problem 1: Draw the following 3D model with the same dimension.

CLASSWORK
- Challenging
Problems: From the following projection create the 3D model

CLASSWORK

(1)

(2) (3)
HOMEWORK

Simple

(4)
CLASSWORK #9

Problems: From the following projection, views create the 3D model.

CLASSWORK

(1)

(2)
Problem: Using parts in the figure make the assembly as shown. Any missing parts should be obtained from the toolbox or modeled from scratch.

CLASSWORK

Q1- Four Bar links

Q2- Slider Mechanism

Horizontal motion aligned with the center of the disk
Part 10: DIN 6921 - M12 x 1.5 x 35 x 35-S
(Hex Flange Bolt - DIN 6921)

Part 11: ISO 1580 - M8 x 10 --- 10S
(Slotted Pan Head - DIN EN ISO 1580)

Q4- Circle-Clip-Pliers
HOMEWORK

Simple

Q5- Scissor

Q6- Digital Caliper

Q7- U-Bolt-Strap

Q8- Roller-Bracket

Part 4: ISO 1580 - M2 x 2.5 --- 2.5S (Slotted Pan Head - DIN EN ISO 1580)

Part 5: DIN 913 - M16 x 20-S (Socket Set Screw Flat Point - DIN 913)

Part 5: DIN 6796-2 (Washer - Conical Spring - DIN 6796)

Part 4: Hexagon Flange Nut DIN 6923 - M8 - S (Hex Flange Nut - DIN 6923)
**Part 4:** ISO 4014 - M8 x 70 x 22-C
(Hex Screw Grade AB - DIN EN 24014)

**Part 5:** DIN 967 - M4 x 5 - Z --- 3.6S
(Pan Head Cross Recess - DIN 967)

**Part 6:** DIN 6921 - M5 x 20 x 20-S
(Hex Flange Bolt - DIN 6921)

**Part 7:** Hexagon Flange Nut DIN 6923 - M5 - S
(Hex Flange Bolt - DIN 6921)
Part 6: ISO 2009 - M3 x 12 --- 12S
(Slotted CTSK Flat Head - DIN EN ISO 2009)

Part 8: ISO 7046-1 - M6 x 16 - Z --- 16S
(CTSK Flat - DIN EN ISO 7046-1)

Q13- CLAMP037

Part 6: DIN 6912 - M12 x 100 --- 30S
(Hex Socket Head - DIN 6912)
Part 3: Hexagon Nut ISO 8673 - M42 x 3 - D - N  
(Hex Nut Style 1 Fine - DIN EN 28673)

Part 2: ISO 4016 - M42 x 200 x 96-NS  
(Hex Bolt Grade C - DIN EN 24016)

Part 4: Hexagon Flange Nut DIN 6923 - M20 - S  
(Hex Flange Nut - DIN 6923)

Part 1: Hexagon Nut ISO 8673 - M42 x 3 - D - N  
(Hex Nut Style 1 Fine - DIN EN 28673)

Part 2: ISO 4016 - M42 x 200 x 96-NS  
(Hex Bolt Grade C - DIN EN 24016)

Part 4: Hexagon Flange Nut DIN 6923 - M20 - S  
(Hex Flange Nut - DIN 6923)

Q17- Plunger-Hook

Q15- Hook-Gancho

Q14- Connecting Rod

Q16- Valve-Cam
Q18- Crane Hook

Part 6: DIN 6921 - M10 x 50 x 50-S
(Hex Flange Bolt - DIN 6921)

Part 7: Hexagon Flange Nut DIN 6923-M10x1.25-N
(Hex Flange Nut - DIN 6923)

Q19- Clamp

Part 10: Hexagon Nut ISO 4034 - M56 - N
(Hex Nut Grade C - DIN EN 24034)
Problem 1: Create the following 3D model
HOMEWORK

Simple

(7) (8)

(9) (10)

(11) (12)
Problem 1: Create the following 3D model

Sketch Entities:

Sketch Tools:

Feature: *Loft, Loft Cut.*

CLASSWORK #12
Average
Problem: Construct the sheet metal parts with the given dimensions.
HOMEWORK

-Simple

(7)

(8)

(9)