# JUNIOR LYCEUM ANNUAL EXAMINATION  2005

Educational Assessment Unit – Education Division

| FORM 4 (4<sup>th</sup> year) | TECHNICAL DESIGN | Time 2 hours |
|---|---|---|

**Instructions**

▪ Write your name and class on all sheets.

▪ Attempt ALL questions.

▪ All answers are to be drawn accurately, with instruments, unless otherwise stated.

▪ All construction lines MUST be left on each solution to show the method employed.

▪ Drawing aids may be used.

▪ Colour / shading should be used where appropriate.

**Information**

▪ All dimensions are in millimetres.

▪ Estimate any missing dimensions not given.

▪ Marks will be awarded for accuracy, clarity and appropriateness of construction.

NAME _____          CLASS _____

| Question | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Max. mark | 35 | 10 | 15 | 22 | 18 |
| Mark | | | | | |

1. The figure below shows a **SUPPORT BRACKET**

    (a)    Draw, using first angle projection the following views
        (i)      a sectional front elevation on plane **A - A**      18 marks
        (ii)    a sectional end elevation on cutting plane **B-B**    12 marks

    (b)    Add the following to your drawing
        (i)      the appropriate symbol to indicate the projection angle
        (ii)    the scale      5 marks
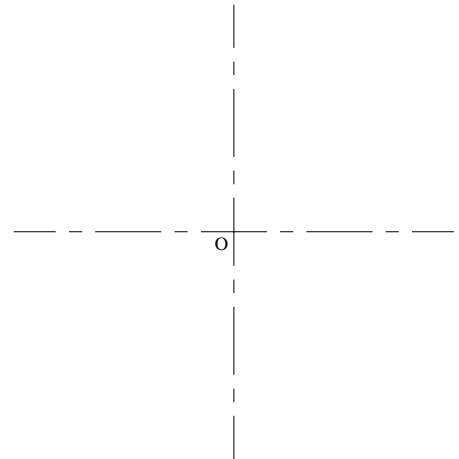
(Total 35 marks)
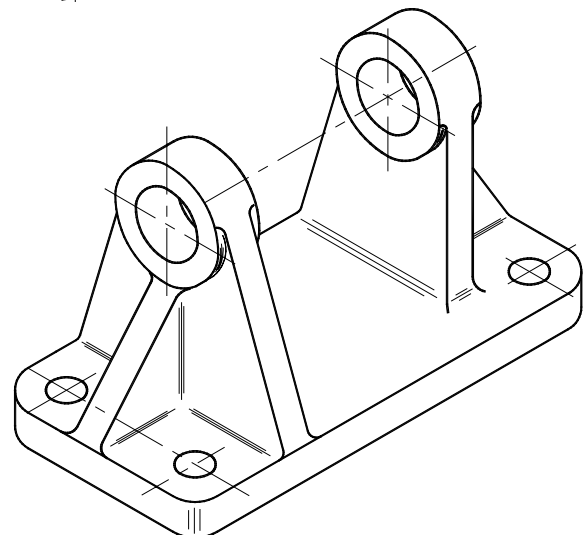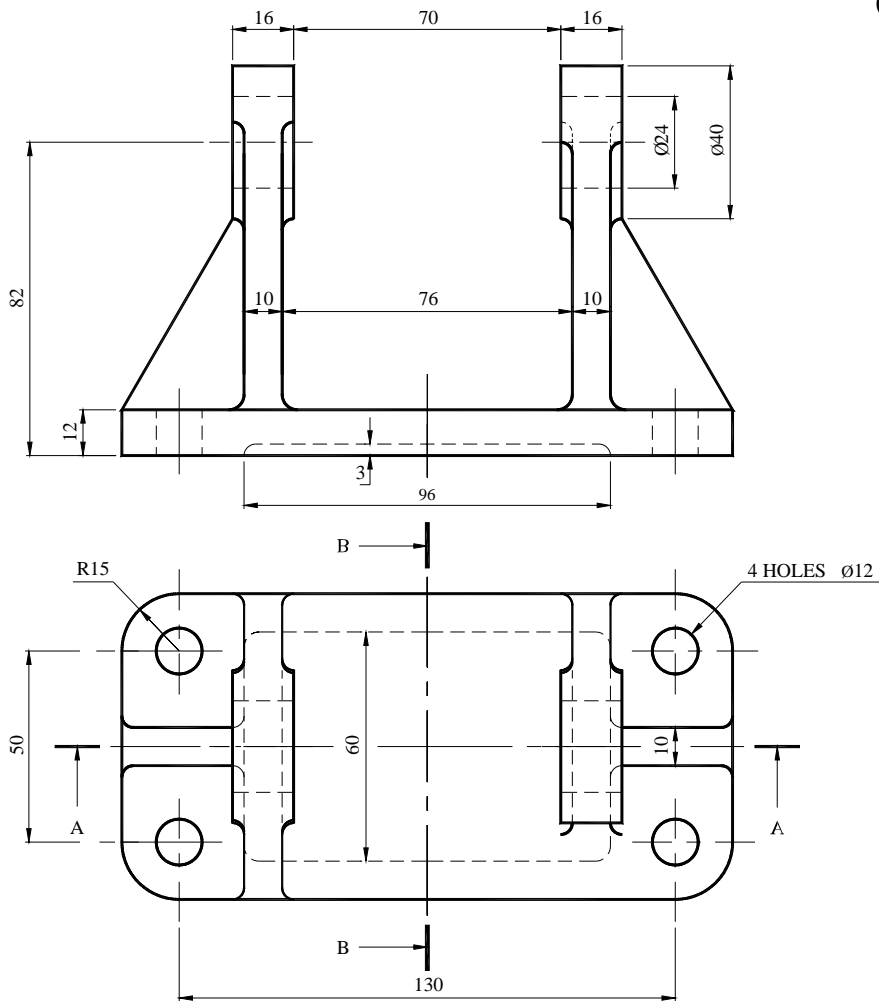
2. The foci of an ellipse are 90mm apart and the minor axis is 80mm long.

    a. Determine the length of the major axis
    b. Draw the ellipse using the concentric-circles method.
    c. Draw a tangent to the ellipse at a point on it 30mm above the major axis.

                            (10 marks)

3. The figure below shows a drawing outline of a rocker-arm.

    a. Copy the outline, full size, using geometrical methods to determine the centers of the arcs.
    b. Indicate the exact points of tangency by drawing short lines across the outline at these points.

The construction lines for the centres of the arcs and the points of tangency must be clearly shown.

A uniform thickness and darkness of outline is required throughout.

                                                 (15 marks)

R25

12

Ø12

R112

R70

R12

60°

3
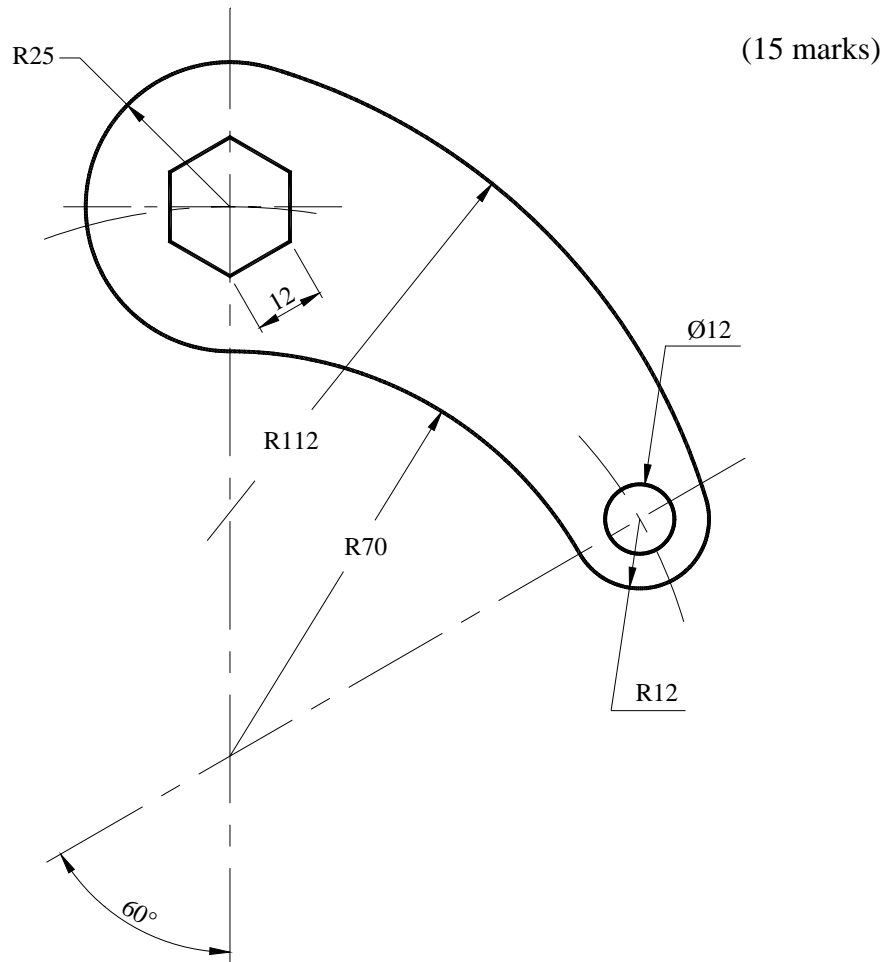
4. The table shows the quarterly bills for a family.

    (a) Draw a pie chart to show a comparison for the quarter **July / September** of the **five** bill items.

    (b) Draw line graphs to show a comparison throughout the year of the bills for **Electricity**, **Petrol** and **Telephone**.

    (c) Add suitable colour and notation to your graphs.
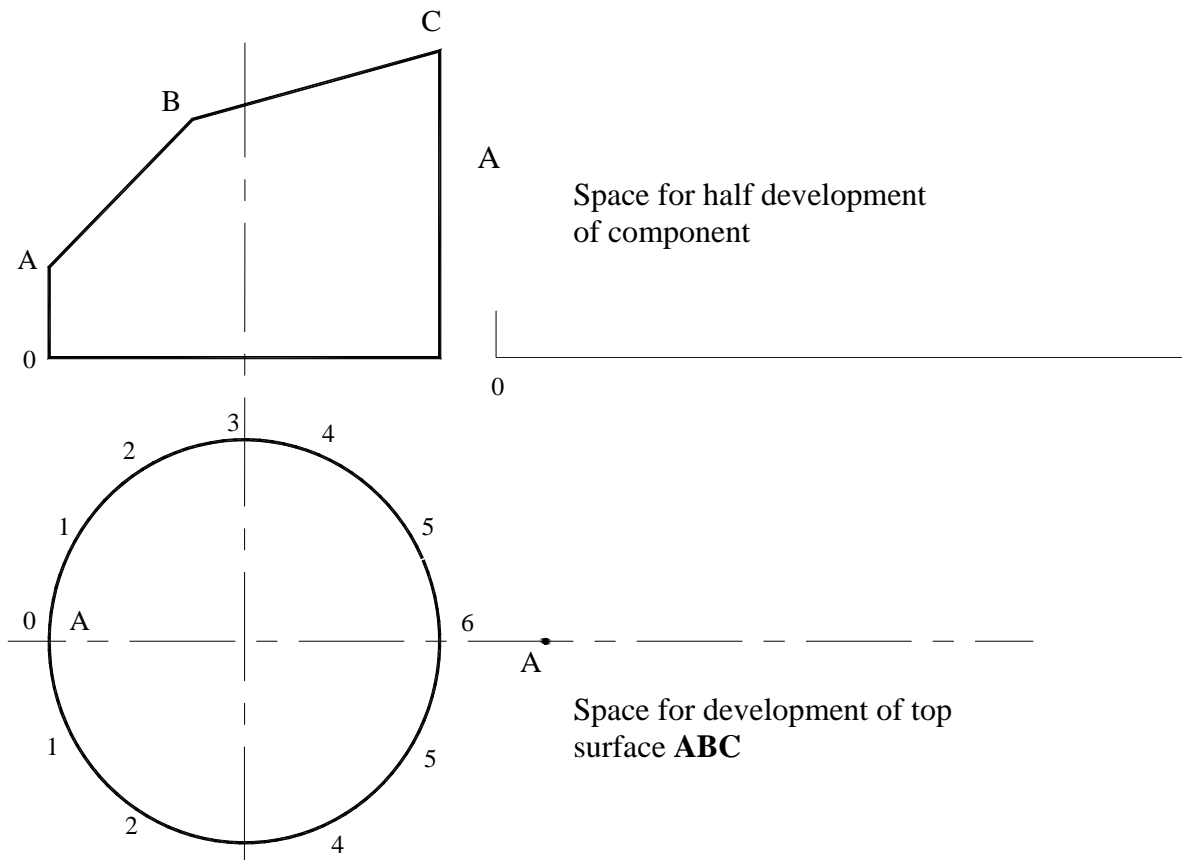
                                              (22 marks)

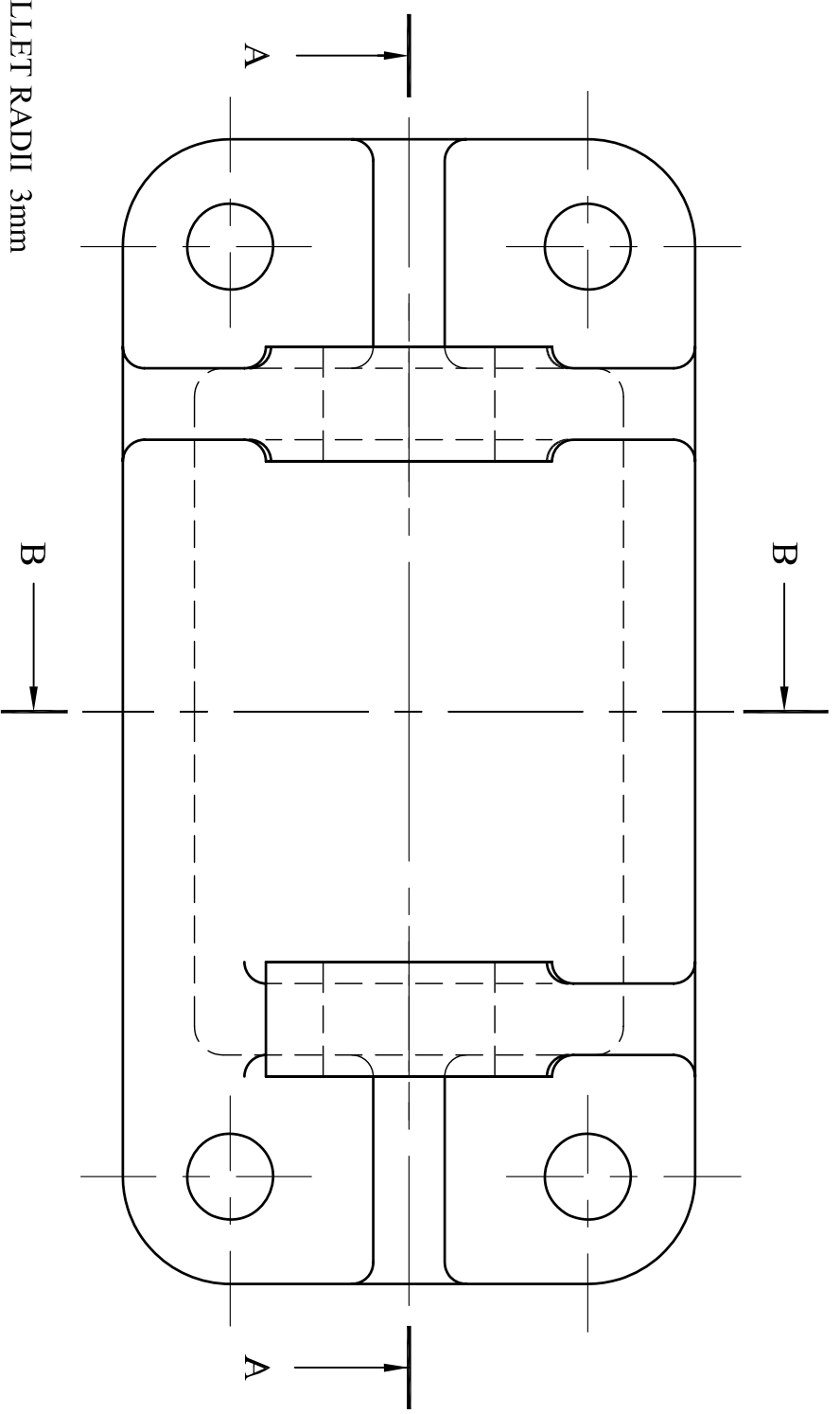| BILL ITEM | JAN/MAR | APR/JUNE | JULY/SEPT | OCT-DEC |
|---|---|---|---|---|
| ELECTRICITY | 100 | 85 | 80 | 85 |
| WATER | 40 | 50 | 100 | 60 |
| PETROL | 80 | 70 | 110 | 65 |
| GAS | 15 | 10 | 15 | 15 |
| TELEPHONE | 40 | 25 | 55 | 35 |
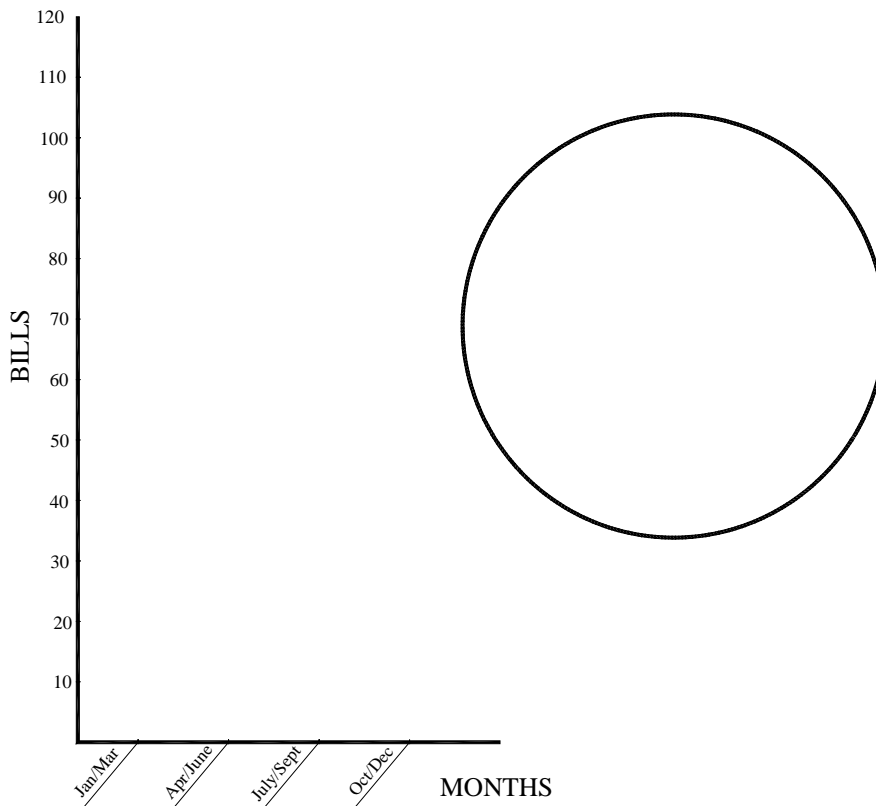
5. The figure below shows an elevation and plan details of a tubular component produced from thin sheet metal with the joint at **OA**.

   (a)    Construct in the space shown a **half development** of this component with the joint at **OA**.

   (b)    Draw in the space indicated a separate one piece development, (known as the true shape of ABC), of the top surface shown as **ABC** in the front view.

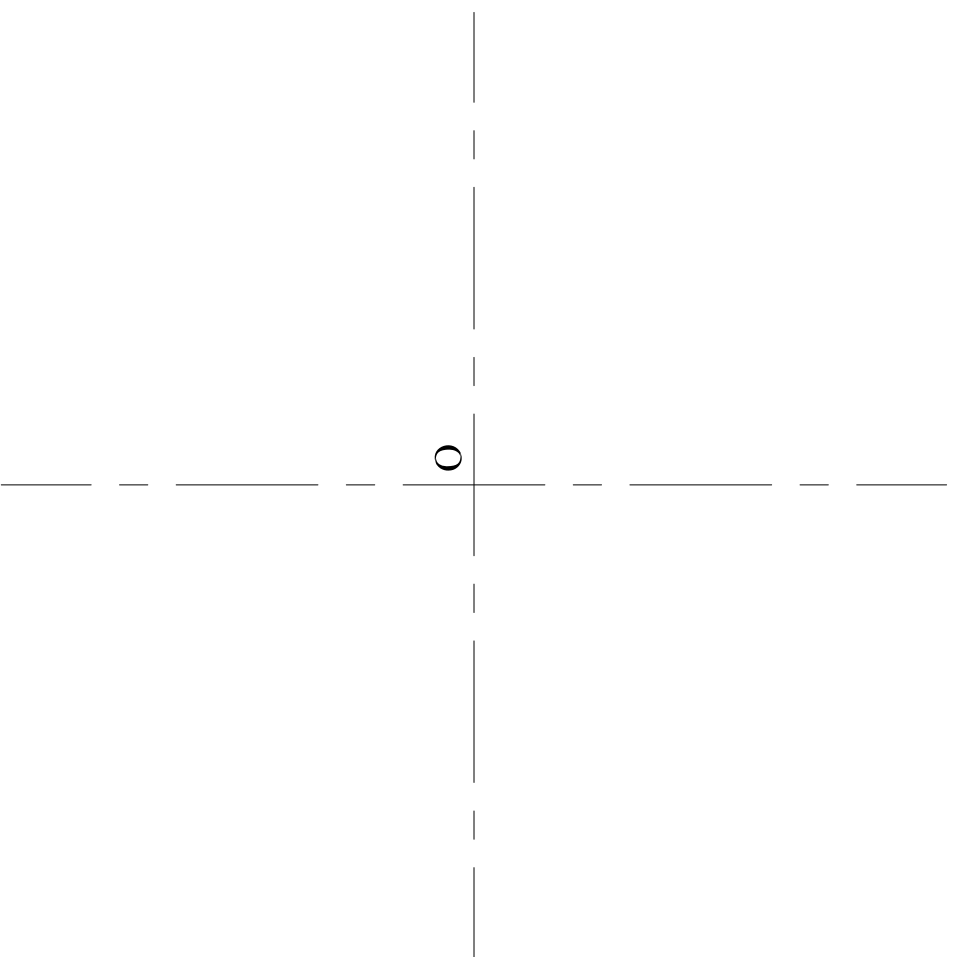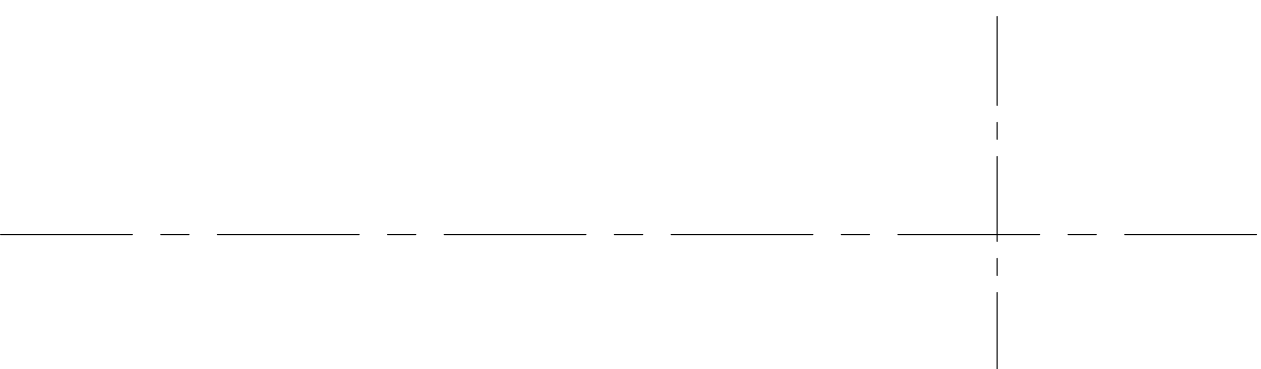(18 marks)

Space for half development of component
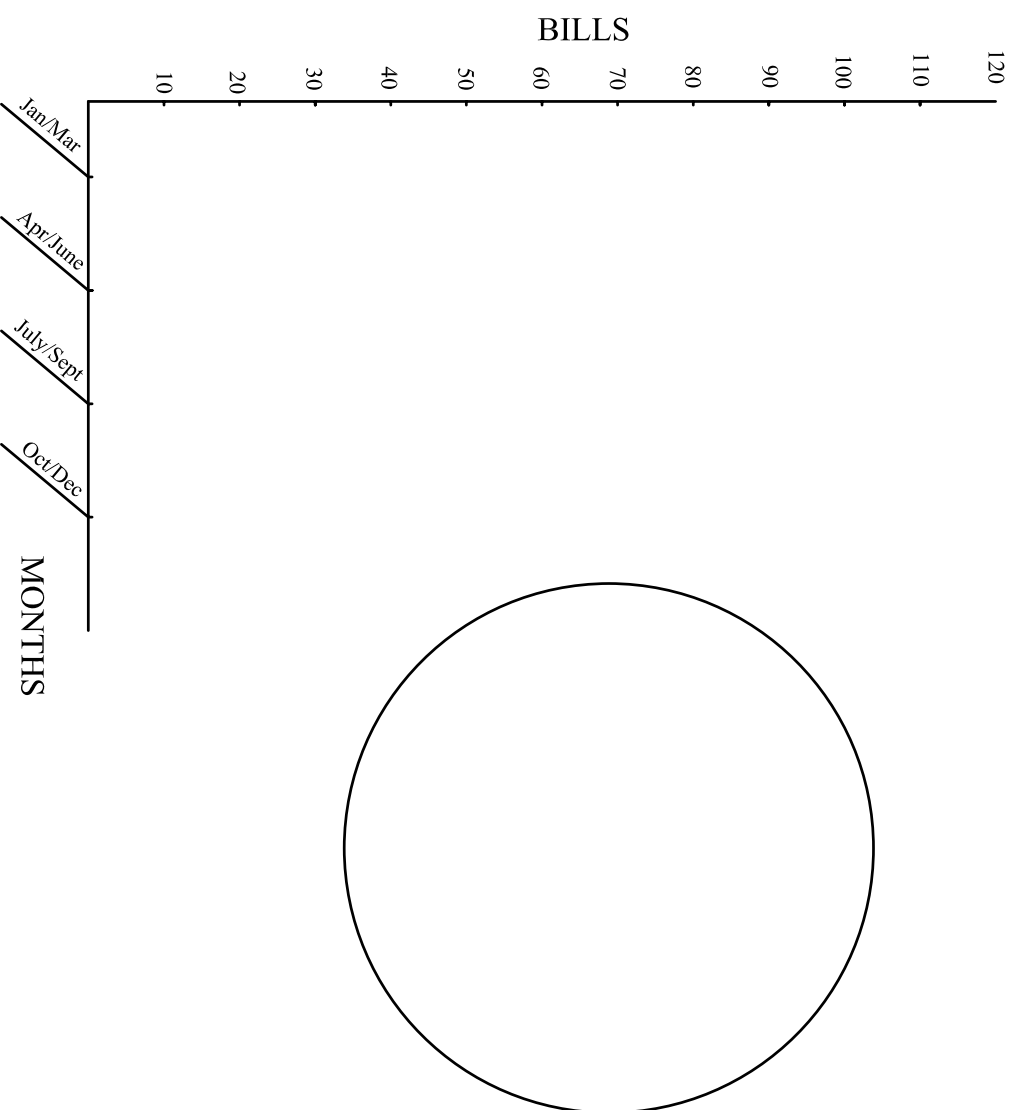
Space for development of top surface **ABC**

5

ALL FILLET RADII 3mm

A

A

B

B

B

B

A

A

O

JLFORM4_4th Year_2005    Educational Assessment Unit    Name:    Class:

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|---|---|---|---|---|
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| PETROL | 80 | 70 | 110 | 65 |
| GAS | 15 | 10 | 15 | 15 |
| TELEPHONE | 40 | 25 | 55 | 35 |

BILLS

120
110
100
90
80
70
60
50
40
30
20
10

Jan/Mar    Apr/June    July/Sept    Oct/Dec

MONTHS

Development of top surface ABC

JLFORM4_ 4th Year_ 2005    Educational Assessment Unit    Name:    Class:

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