7449/1

**DRAWING AND DESIGN (THEORY)**

Paper 1

Time 2½ hours

BUNAMFAM

**MARKING SCHEME**

Kenya Certificate of Secondary Education

**DRAWING AND DESIGN**

**MARKING SCHEME**

**SECTION A (50 marks) Answer ALL the questions in this section in the spaces provided.**

**1. Explain technical drawing as means of communication. (3 marks)**

i) is a discipline that is able to be understood world wide by those who have studied it. It is made

possible due to the standardization of conventions, abbreviation and symbols.

ii) NB: Technical drawing is a means of communication between engineers and / or designers and the

production / manufacturing industries. ***3 marks***

**2. Name three types of lines and specify the pencil grade to be used in each case. (3 marks)**

i) Thick continuous - visible outlines B or HB

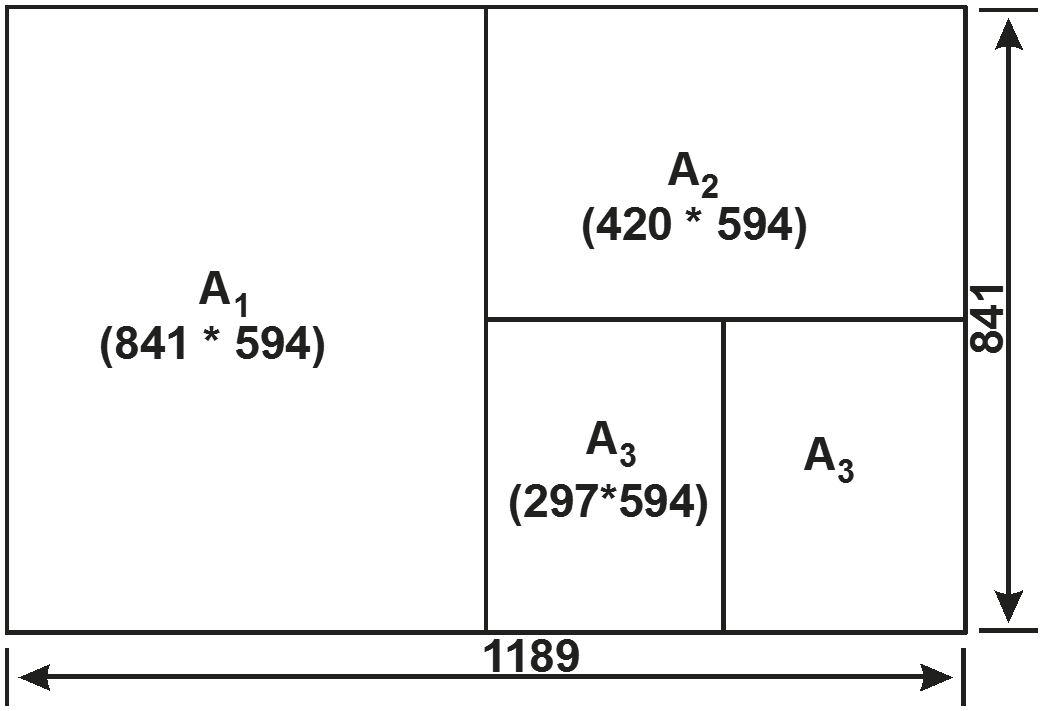
ii) Medium Thin Cont - Dimensional or external outlines.

- 2 H or H

iii) Very thin cont. lines - construction or guide lines - 3H or 4H. ***3 marks***

**3. a) Illustrate how an AO drawing paper can be sub-divided to generate paper sizes A1, A2 and**

**A3. (3 marks)**



**(420×594)**

**(841 × 594)**

**(297×594)**

**b) Show dimensions of**

**A0** = 841 × 1189 = 841 × 1189

**A1 =** 841 × 1189 = 841 × 594

2

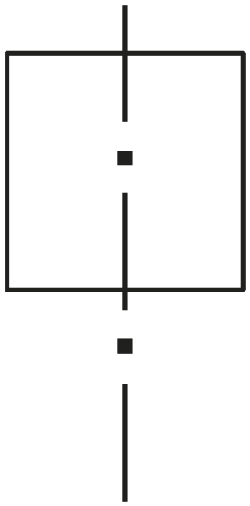
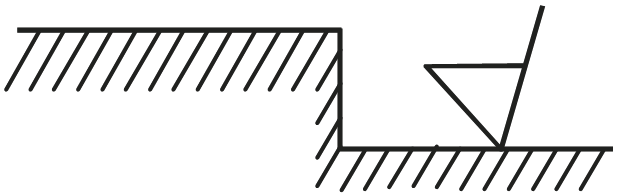
**A2** = 841 × 594 = 420 × 594

2

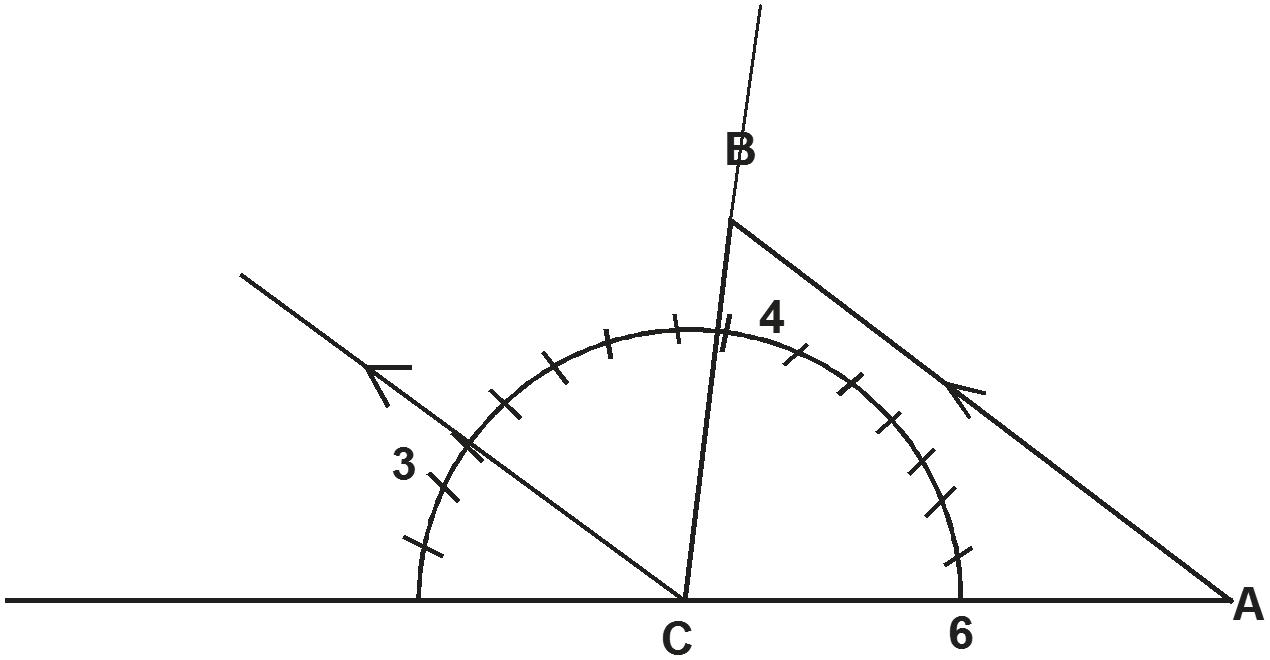
**A3** = 594 × 420 = 297 × 420

**4. Use standard symbols and abbreviations to represent each of the following:**

**i) Cylinder ii) Machined surface. (4 marks)**



**5. Construct a triangle ABC with angles in the ratio 3 : 4 : 6 given the length of the base as 50mm. (6 marks)**



Solution

3 + 4 + 6 = 13

Draw semi-circle and divide it into 13 parts

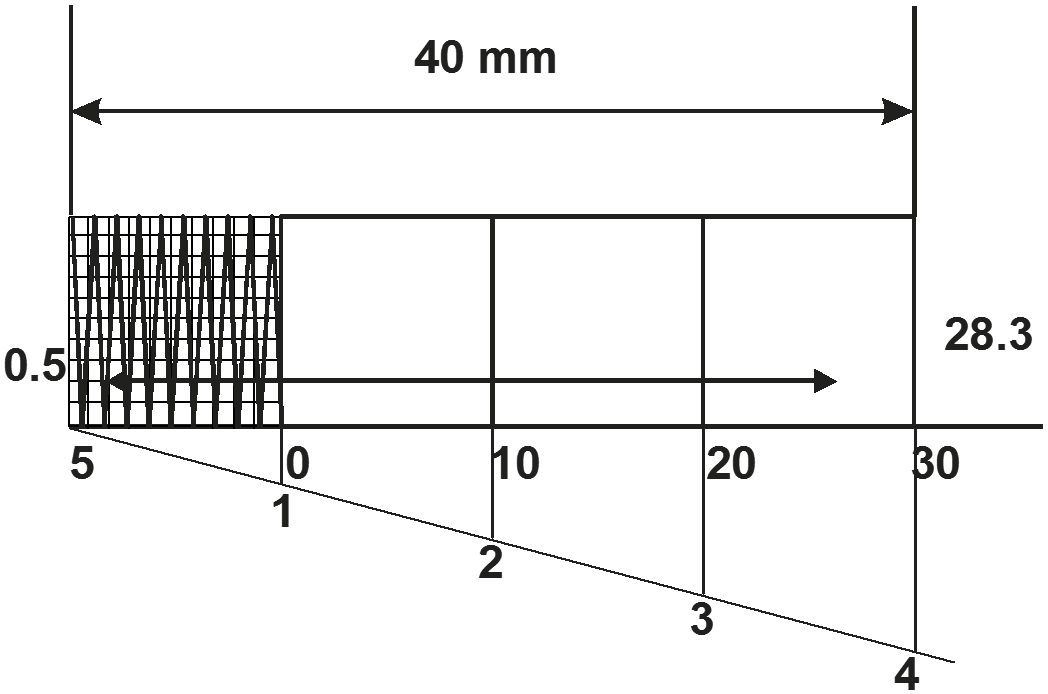
Single-out the ratios 3 : 4 : 6 on the semi-circle.

**6. Construct a diagonal scale of 2 : 1 having an accuracy of 0.1mm to read to a maximum of**

**40mm. Show a reading of 28.3mm (6 marks)**

Solution

Scale length

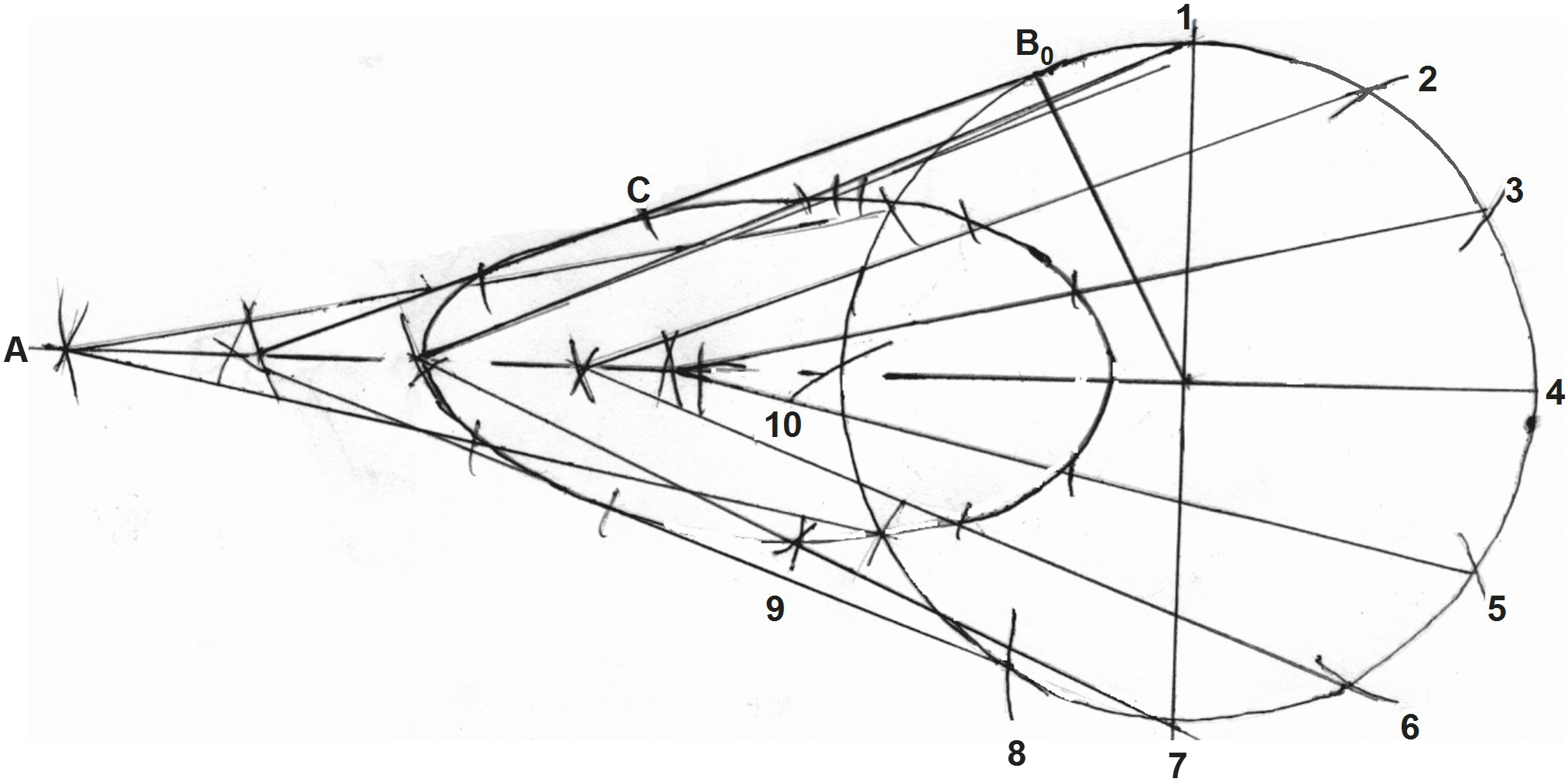


= R.F × MAX. LENGTH

= 2 × 40mm = 80mm

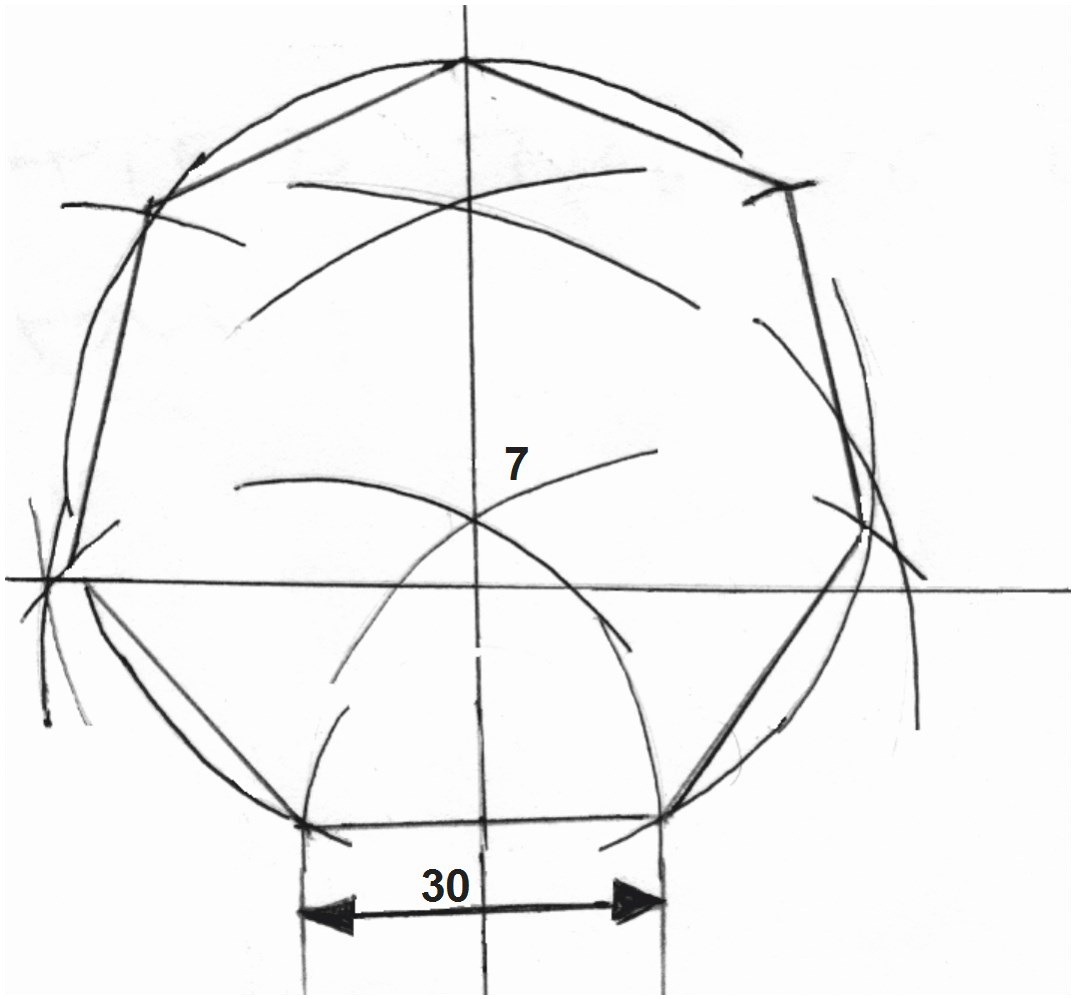
1

**7. Locus of point C for one revolution of crank OB (6 marks)**



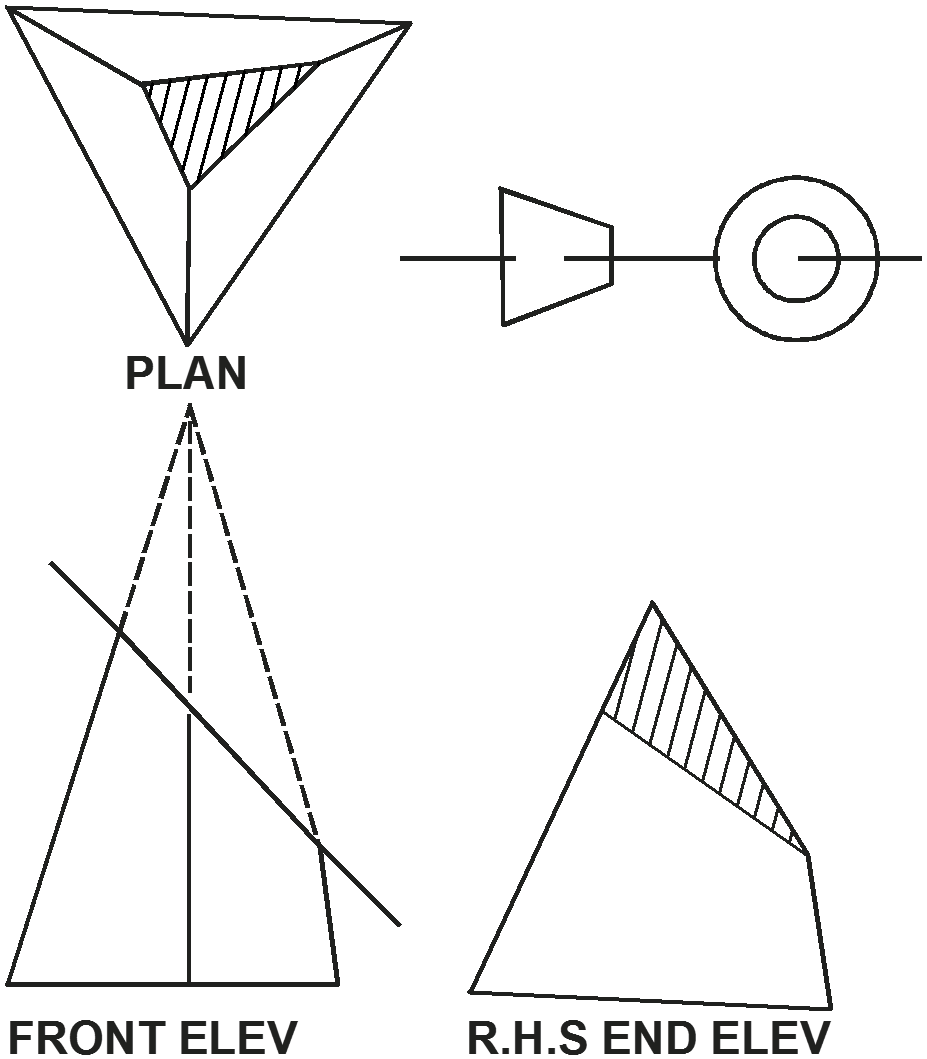
**LOCUS OF POINT C**

**8. Using a ruler and pair of compasses only, construct a REGULAR HEPTAGON. Whose sides are 30mm long. (6 marks)**



**HEPTAGON SIDES 30mm**

**9. (6 marks)**



TRUNCATED TRIANGULAR PYRAMID

**10. Define the following properties of materials:-**

**i) Hardness** - when it can withstand scratching, wear or Abrasion, indentation by harder bodies. e.g.

marking knife, files etc.

**ii) Toughness** - the ability of a material to withstand impact load or hammering load.

**iii) Elasticity** - Ability of a material to deform under load and return to its original shape or size when the load is removed. So long as it does not exceed its elastic limit.

**iv) Plasticity** - ability of a material to deform under load and retain its new shape when the load is removed. e.g. soft steel. **(4 marks)**

**SECTION B (20 marks) This question is compulsory. Candidates are advised to spend not more than one hour on this question.**

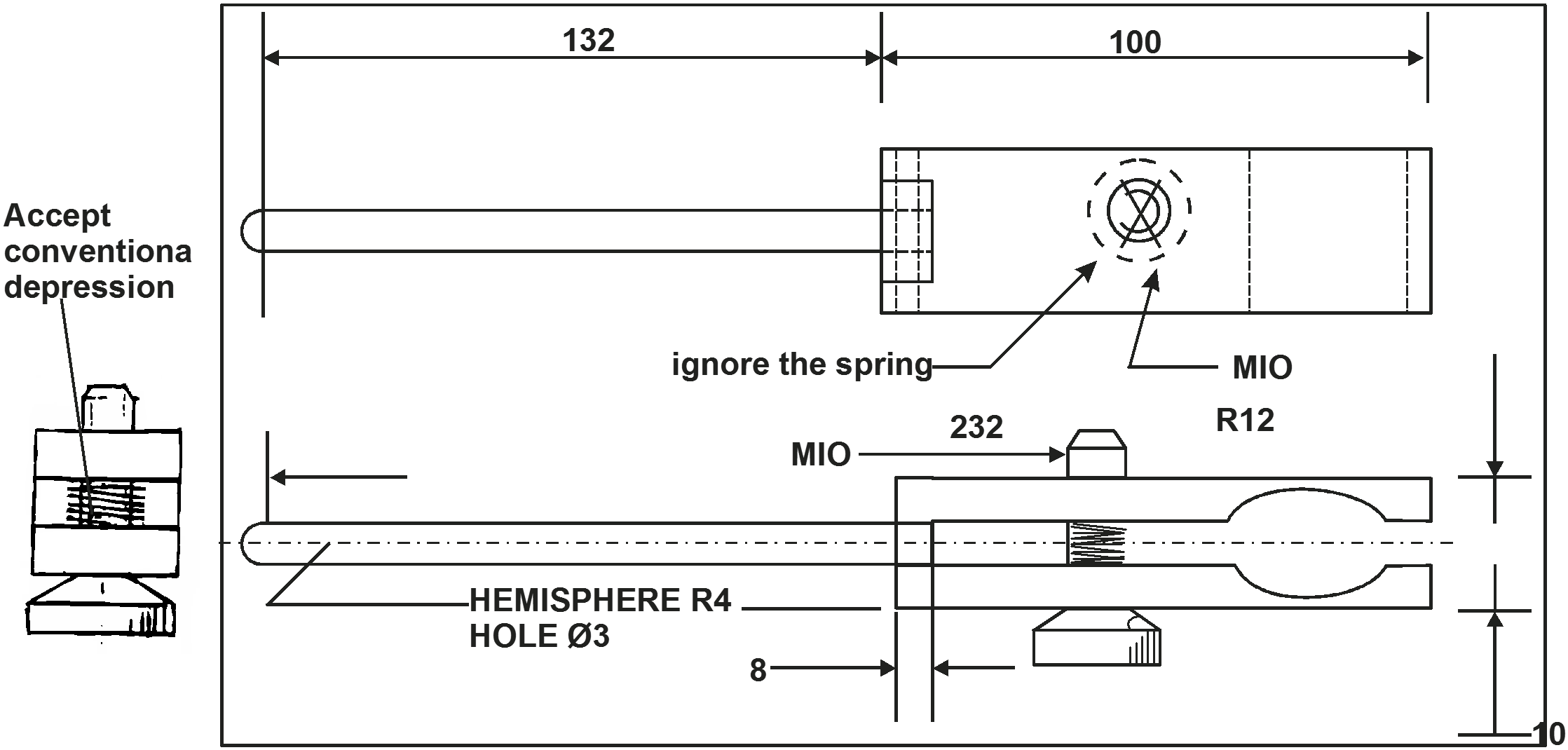
**11. Figure 7 shows parts of a retort stand clamp drawn in first angle projection. Assemble the parts and draw FULL SIZE, the following views of the vice in third angle projection:**

**a) A sectional front elevation along the cutting plane P - P**

**b) End elevation in the direction of arrow X**

**c) Plan**

**Insert three leading dimensions and do not show hidden details.**



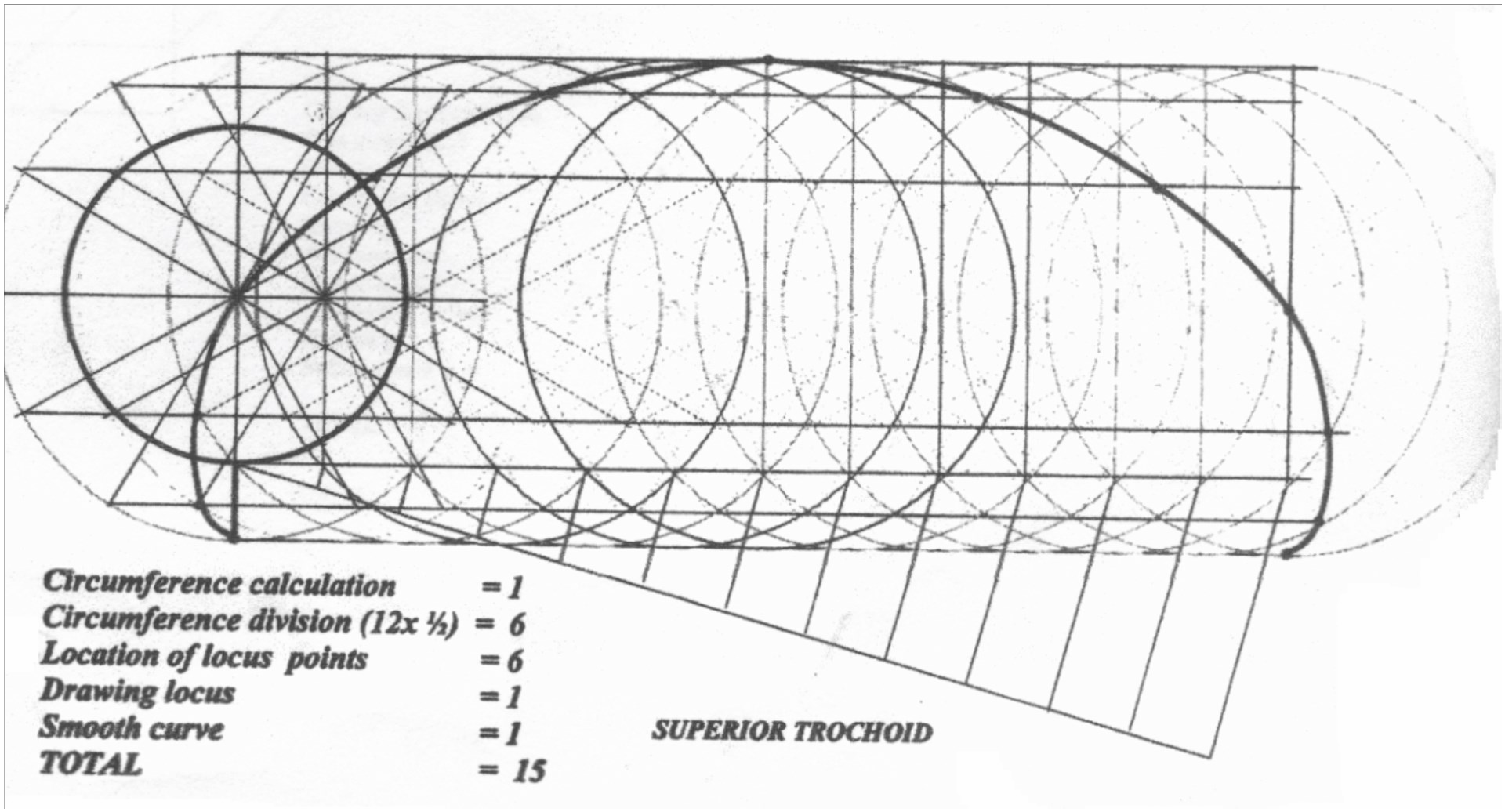
|  |  |  |
| --- | --- | --- |
| **PARTS NAME** | **MATL** | **NO. OFF** |
| E PIN | M.S | 1 |
| D SCREW | M.S | 1 |
| C LOWER JAW | M.S | 1 |
| B UPPER JAW | M.S | 1 |
| A SCREWED ROD | M.S | 1 |
| SCALE | 1 : 1 | NAME |

**SECTION C (30 marks)**

**12. Figure 8 shows the mouth of a cup having Ø45mm and a handle protruding 10 mm.**

**If the cup is rolled on the surface AA for one complete revolution, construction the locus of point X on the handle. (15 marks)**

SOLUTION



**13. Figure 9 shows a square pyramid transacted along X - X and Y - Y.**

**Copy the given front elevation, complete the plan and draw the end elevation in the direction of arrow U. (15 marks)**

14. Make an isometric drawing from the two views given in FIGURE. (15 marks)

