



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1280(E)(A5)T

NATIONAL CERTIFICATE

PICTORIAL DRAUGHTING N4

(8090214)

5 April 2018 (X-Paper)
09:00–13:00

CLOSED-BOOK EXAMINATION

REQUIREMENTS: One A4 draughting film or gateway tracing paper
One A2 drawing sheet

This question paper consists of 4 pages, 5 diagram sheets and 1 formula sheet.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
NATIONAL CERTIFICATE
PICTORIAL DRAUGHTING N4
TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
 2. Read ALL the questions carefully.
 3. Use both sides of the A2 DRAWING SHEET and answer QUESTIONS 1, 2 and 3 on the front; QUESTIONS 4 and 5 on the reverse; and QUESTION 6 on the A4 DRAUGHTING FILM.
 4. A balanced layout is very important and candidates will be penalised for poor planning.
 5. Draw a 15 mm border around the DRAWING SHEET (on both sides).
 6. Clearly indicate the question numbers.
 7. ALL drawing work, including candidate information, must be completed in pencil on the A2 DRAWING SHEET and in draughting ink on the A4 DRAUGHTING FILM.
 8. ALL drawing work must comply with the SABS 0111-1990 Code of Practice.
 9. On completion, fold the A2 DRAWING SHEET to A3 size with the EXAMINATION NUMBER visible on the front. The DRAUGHTING FILM must be placed inside the folded A2 DRAWING SHEET. NO staples may be used.
 10. Use your own discretion for dimensions not given.
 11. Use a 3 mm fillet radius for radii not given.
 12. Work neatly.
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QUESTION 1: FREEHAND DRAWING

FIGURE 1, DIAGRAM SHEET 1 (attached), shows a view of a 0–25 mm outside micrometer.

Make a neat freehand drawing of the outside micrometer approximately one-and-a-half times the given size. Add a title centred beneath the drawing.

[14]**QUESTION 2: ONE-POINT PERSPECTIVE DRAWING**

FIGURE 2, DIAGRAM SHEET 2 (attached), shows two views of a solid-base bracket in first-angle orthographic projection.

Draw, to scale 1 : 1, a one-point perspective drawing of the base bracket. The distance of the eye in front of the picture plane (PP) is 130 mm and the height of the eye above the ground line (GL) is 100 mm. Point A is situated on the ground line (GL) up against the picture plane (PP) and in line with the centre of vision (CV). Line A-B is to the left of the centre of vision (CV) and parallel on the ground line (GL).

(16)

Show ALL necessary points on the construction, for example CV, VPs, et cetera.

(4)**[20]****QUESTION 3: ISOMETRIC PROJECTION**

FIGURE 3, DIAGRAM SHEET 3 (attached), shows two views of a geometrical block in first-angle orthographic projection.

Do NOT copy the given views, but construct a suitable isometric scale.

(2)

Draw, to scale 1 : 1, an isometric projection of the geometrical block. Do NOT show any hidden detail. Do NOT insert any dimensions.

(18)**[20]**

QUESTION 4: SQUARE-THREAD CONSTRUCTION

A nut with an outside diameter of 130 mm has a height of 90 mm. An internal square thread is machined in the nut.

Draw, to scale 1 : 1, a full-sectional front view of this nut to show TWO full left-handed turns of the square thread. The pitch of the thread is 36 mm with the larger internal diameter 100 mm. The drawing must be in a vertical position. Show ALL construction lines on the drawing. Do NOT show any hidden detail or calculations.

[14]**QUESTION 5: GEAR-TEETH CONSTRUCTION**

FIGURE 4, DIAGRAM SHEET 4 (attached), shows a front view of a driven gear made of mild steel.

Do NOT copy the given drawing, but draw, to scale 1 : 1, an outside left view to show THREE complete teeth of the gear constructed according to an approximate method. The remainder of the gear must be drawn according to the conventional representation.

(10)

Show ALL construction lines and calculations on the completed drawing.

(4)

[14]**QUESTION 6: INK DRAWING**

FIGURE 5, DIAGRAM SHEET 5 (attached), shows a half-sectional front view of a pulley, with the top half in section.

Draw, with ink pens, to scale 1 : 1, a full-sectional front view of the pulley. Insert TWO linear dimensions and TWO diametrical dimensions on the completed drawing. Do NOT show any hidden detail. Use your own discretion for dimensions not given.

[18]**TOTAL: 100**

DIAGRAM SHEET 1

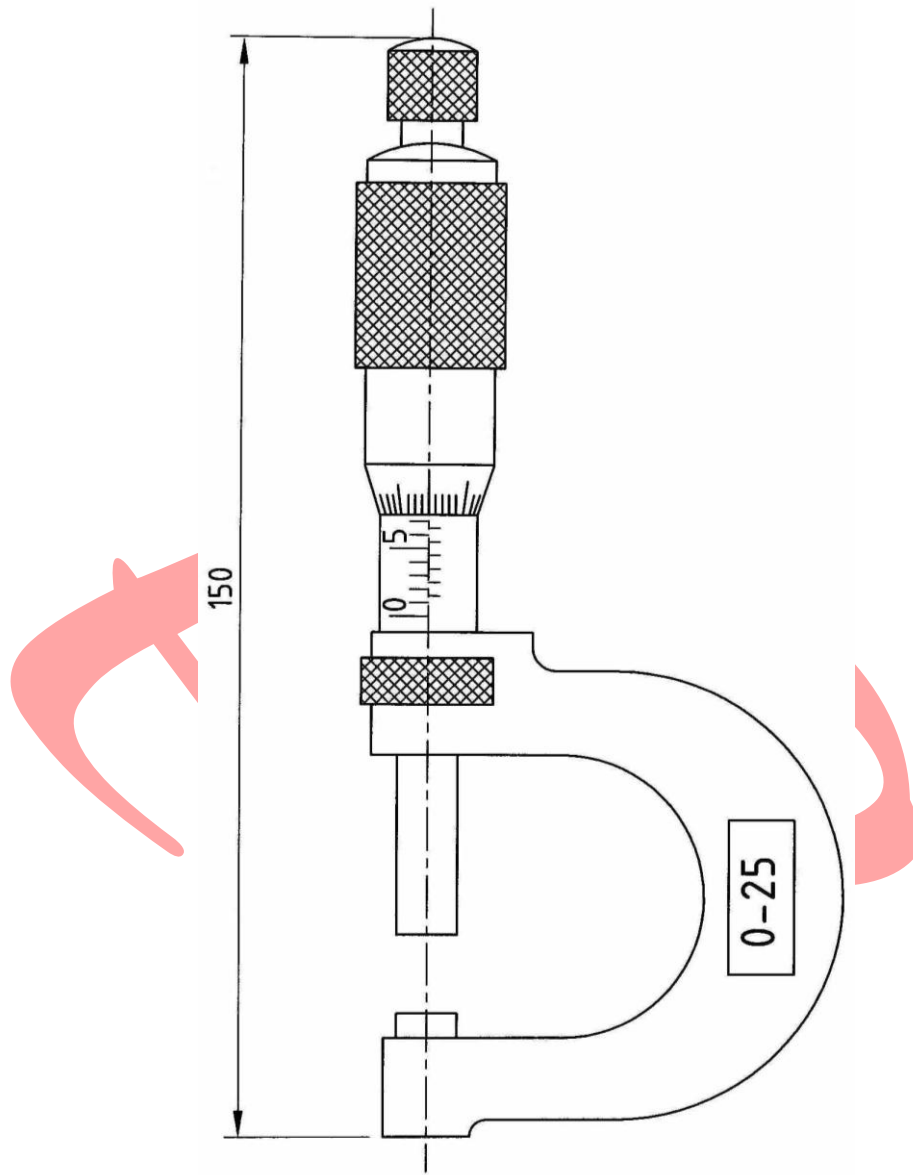


FIGURE 1

DIAGRAM SHEET 2

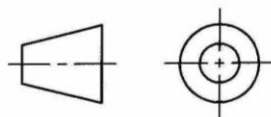
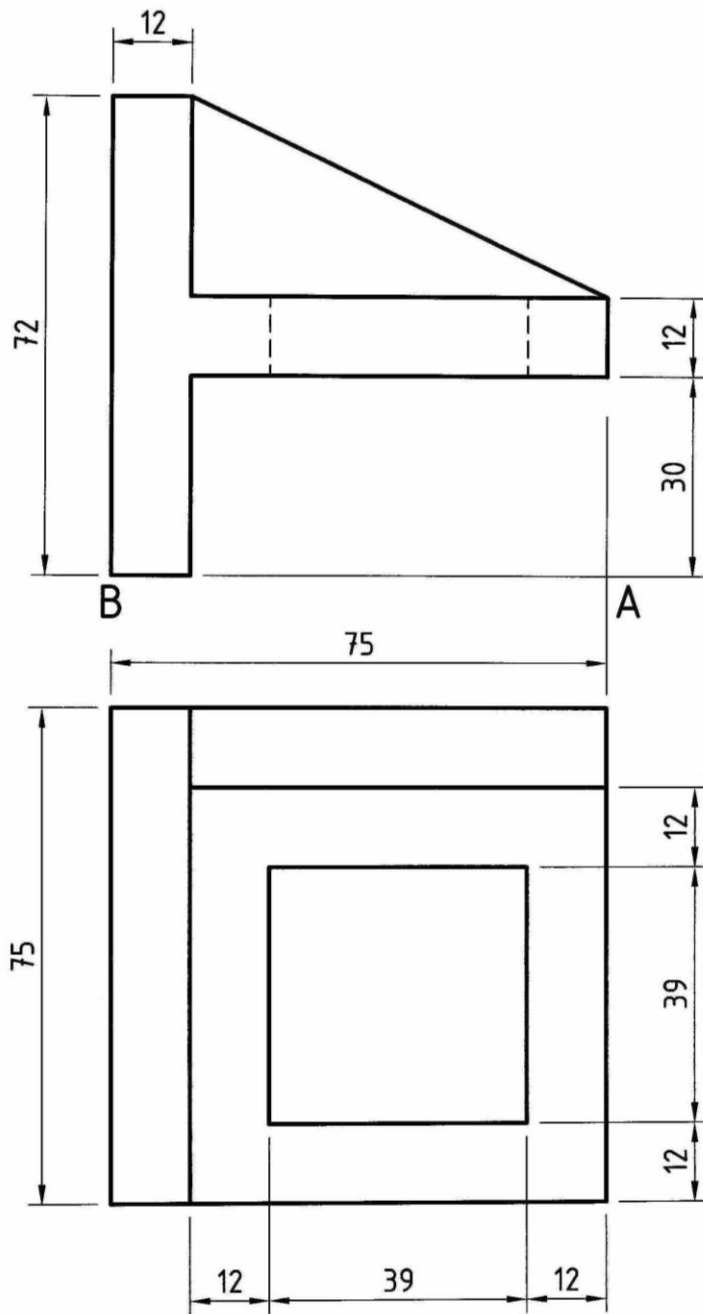


FIGURE 2

DIAGRAM SHEET 3

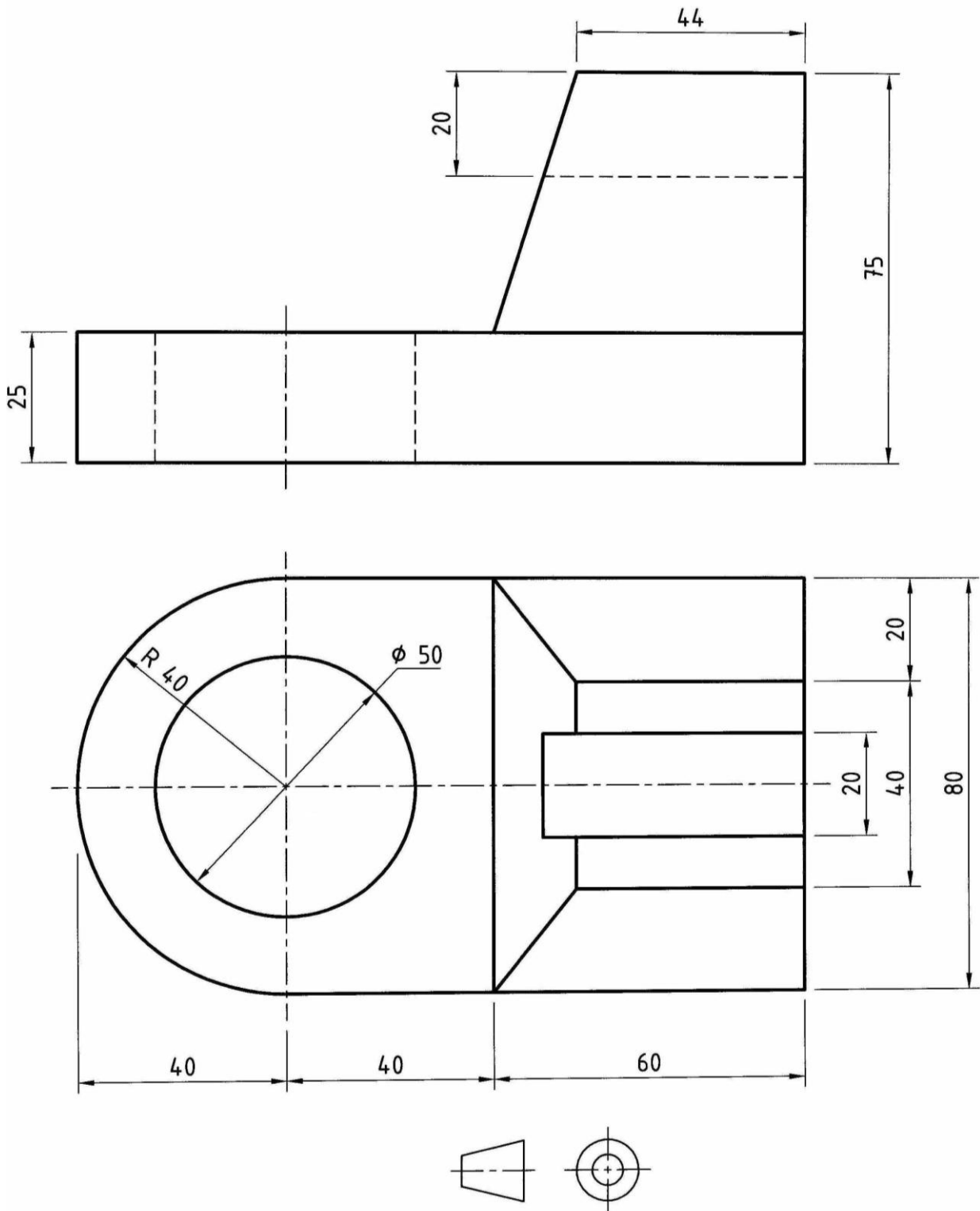


FIGURE 3

DIAGRAM SHEET 4

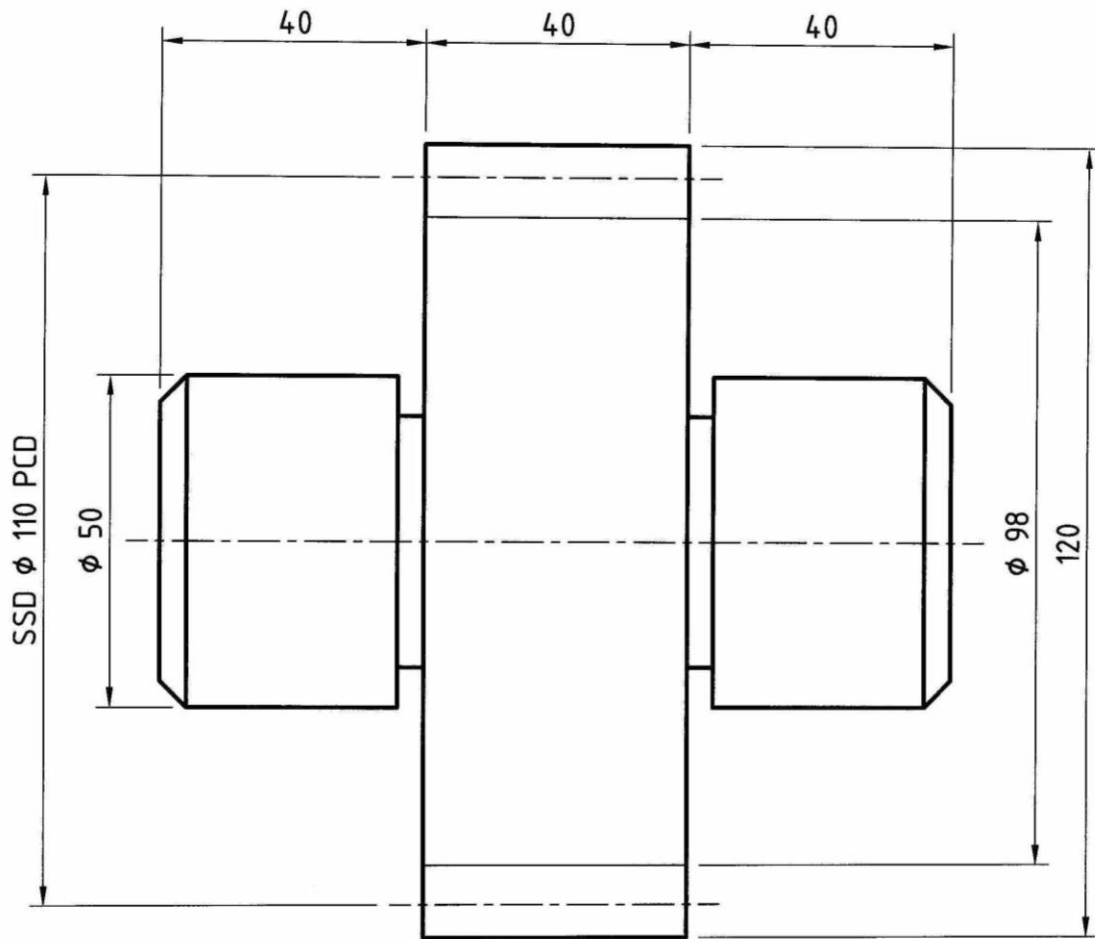
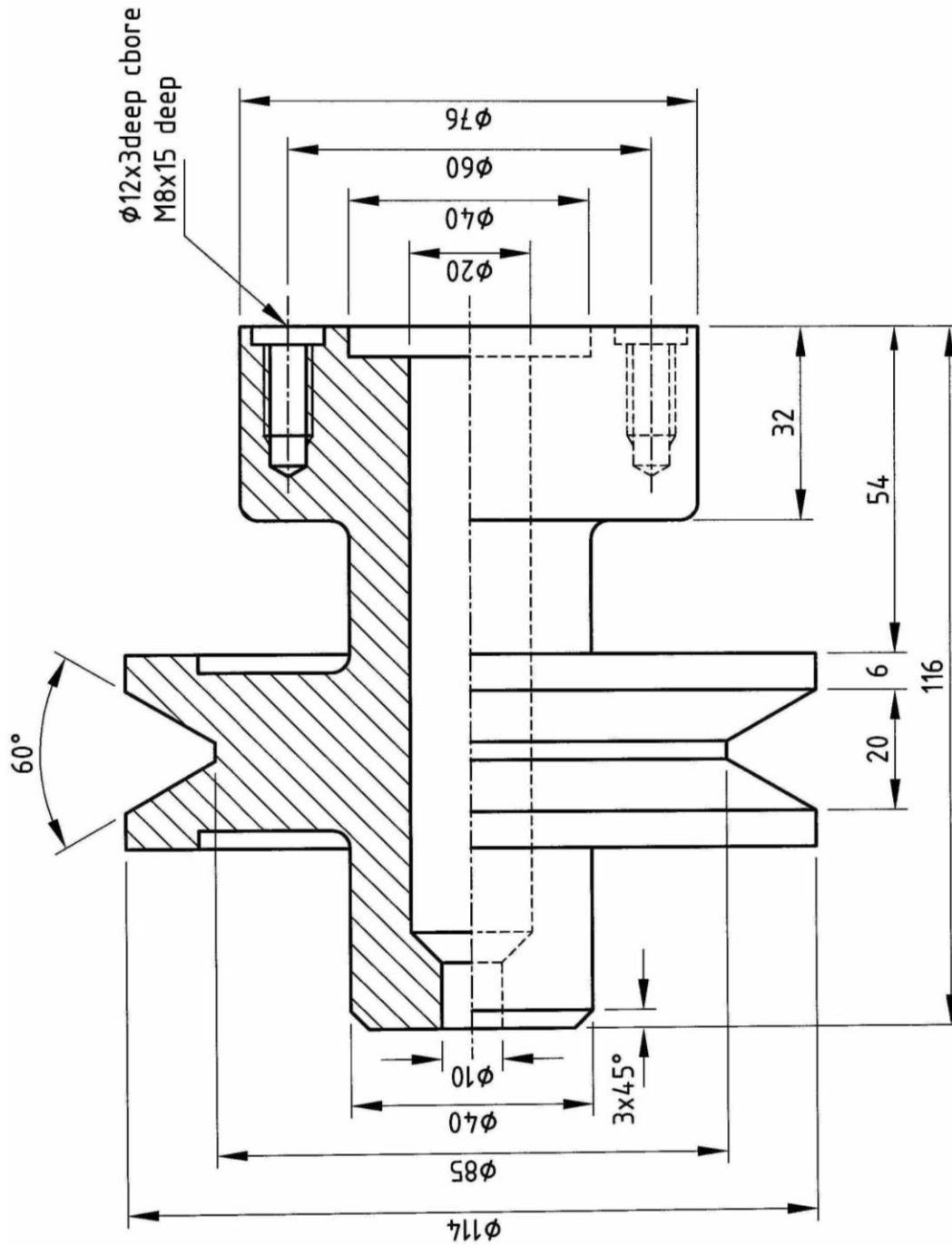


FIGURE 4

DIAGRAM SHEET 5



PULLEY
SCALE 1 : 1

FIGURE 5

FORMULA SHEET

1. Screw-thread construction

Length = (pitch × number of turns) + pitch/2

Pitch divisions = pitch/12

2. Gear-teeth construction

Module = addendum

Dedendum = 1,25 × module

PCD = module × number of teeth

Fillet radius = 0,3 × module

Circular pitch = 3,142 × module

3. Square-spring construction

Length = (lead × number of turns) + material thickness