higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T580**(E)**(A11)T

NATIONAL CERTIFICATE

ENGINEERING DRAWING N2

(8090272)

11 April 2019 (X-Paper)
09:00–13:00

REQUIREMENTS: ONE A2 drawing sheet (BOE 8/20)

NO ANSWER BOOK is to be given to candidates.

Calculators and drawing instruments may be used.

This question paper consists of 13 pages.

Copyright reserved

Downloaded from www.mycourses.co.za

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
ENGINEERING DRAWING N2
TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Draw ALL drawings neatly using drawing instruments unless otherwise specified.
5. Candidates may only use their own drawing instruments.
6. ALL drawings must conform to the latest SANS Codes of Practice.
7. Draw a 15 mm border on both sides of the DRAWING SHEET.
8. Unspecified radii must be R3.
9. Only the candidate information on the DRAWING SHEET must be done in ink. ALL other drawings and written work, must be done in pencil.
10. Use both sides of the DRAWING SHEET.
11. A balanced layout is very important and candidates will be penalised for poor planning.
12. Work neatly.

Copyright reserved

Downloaded from www.mycourses.co.za

QUESTION 1: MACHINE SCREWS, COMPUTER-AIDED DRAUGHTING AND ELECTRICAL FITTINGS

NOTE: This question must be answered directly on the DRAWING SHEET and NOT in a separate ANSWER BOOK.

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.8) on the DRAWING SHEET.

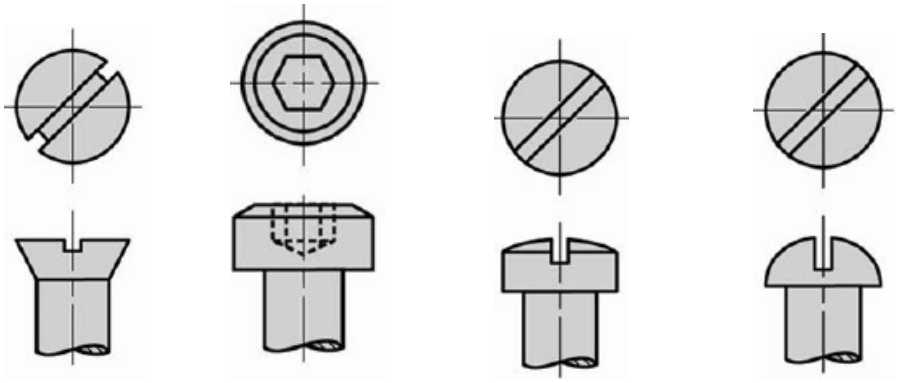
1.1.1 Which ONE of the following is NOT a storage device:

A CD
B Mouse
C Memory stick
D External hard disk drive

1.1.2 To calculate the height of a hexagon-head bolt you have to multiply the diameter with:

A 0,1
B 0,7
C 0,8
D 1,5

1.1.3 Which ONE of the following machine screw heads is a fillister head:



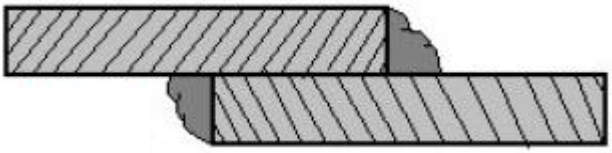
A B C D

Downloaded from www.mycourses.co.za

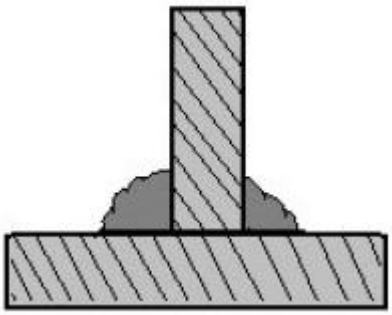
1.1.4 Which ONE of the following figures shows a butt joint:

A

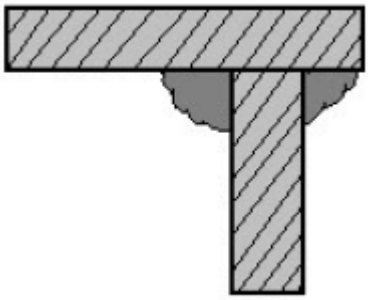
B



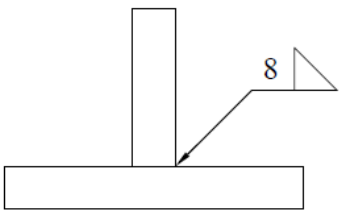
C



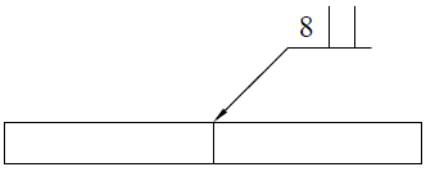
D



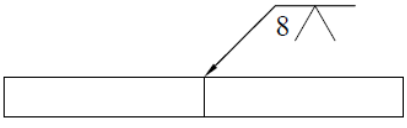
1.1.5 Which ONE of the following symbols represents an 8 mm fillet weld on the other side:



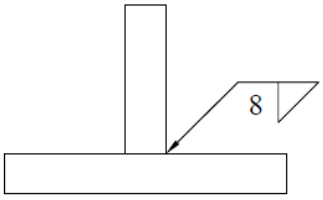
A



B



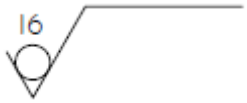
C



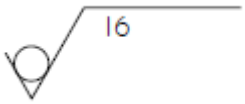
D

Downloaded from www.mycourses.co.za

1.1.6 Which of the following is the surface texture symbol for removing material by means of machining with a roughness value of 16µm?

A 

B

C 

D

1.1.7 The abbreviation HEX HD stands for …

A hexagonal.
B hard drive.
C hexagonal head.
D hexagonal hard drive.

1.1.8 CAD is the acronym for:

A Computer-add drawing
B Computer-aided draughting
C Complex-access draughting
D Calculated-access drawing

(8 × 1) (8)

Downloaded from www.mycourses.co.za

1.2 Redraw the given view in FIGURE 1 freehand in good proportion, to approximately the given size. (3)

Complete the following on the drawing:

1.2.1 Label the view by replacing (a)–(c) with the correct terms. (3)

1.2.2 Name the Key type and write it as title beneath the view. (1)

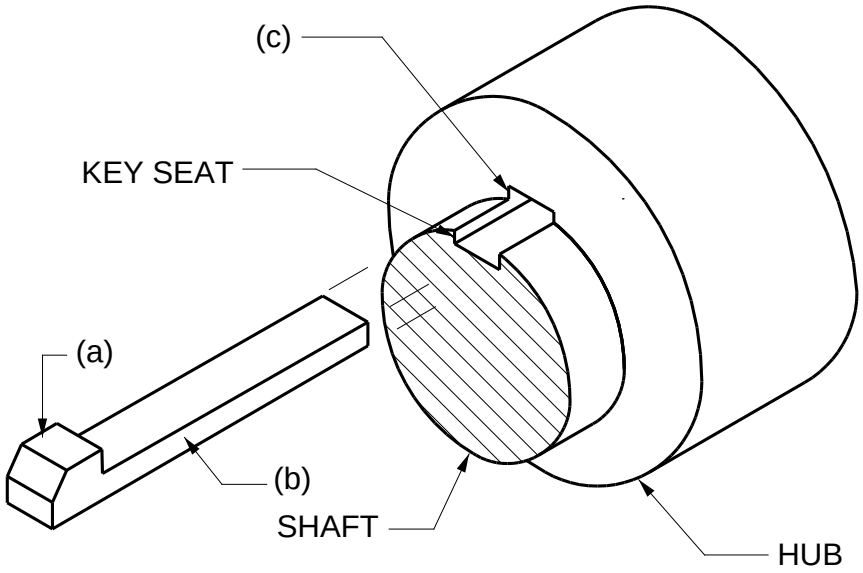


FIGURE 1

[15]

Downloaded from www.mycourses.co.za

QUESTION 2: SCREW THREADS

FIGURE 2 shows a sectional front view and a top-view of a special machined nut in first-angle orthographic projection.

Draw, to scale 1:1, a full sectional front view of the nut, providing the 64 mm length with a single-start internal right-hand V-screw thread, with a pitch 8 mm.

Show ALL sectioning lines where necessary.

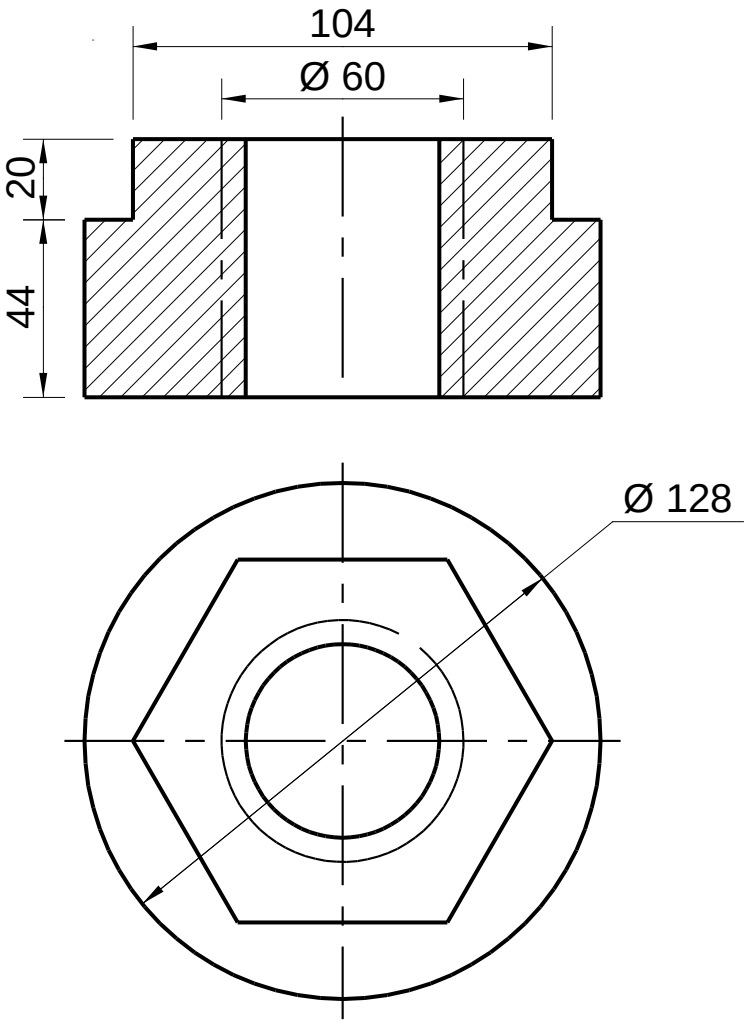


FIGURE 2

[12]

Downloaded from www.mycourses.co.za

QUESTION 3: FIRST-ANGLE ORTHOGRAPHIC PROJECTION

FIGURE 3 shows two views of a screw jack and cub. The cub screw is to be locked by means of a M50 hexagonal nut. The cub screw is in its correct working position, however the M50 hexagonal nut has been omitted.

Draw, to scale 1:2, the following views of the screw jack in first-angle orthographic projection:

3.1 A half-sectional front view with the right side in section and with the M50 hexagonal nut in position (11)

3.2 An outside left view with the M50 hexagonal nut in position (8)

3.3 Print the following title and scale centred beneath the layout.

SCREW JACK
SCALE 1:2 (2)

3.4 Insert the first-angle orthographic projection symbol below the title and scale. (1)

Layout and neatness (2)

Downloaded from www.mycourses.co.za

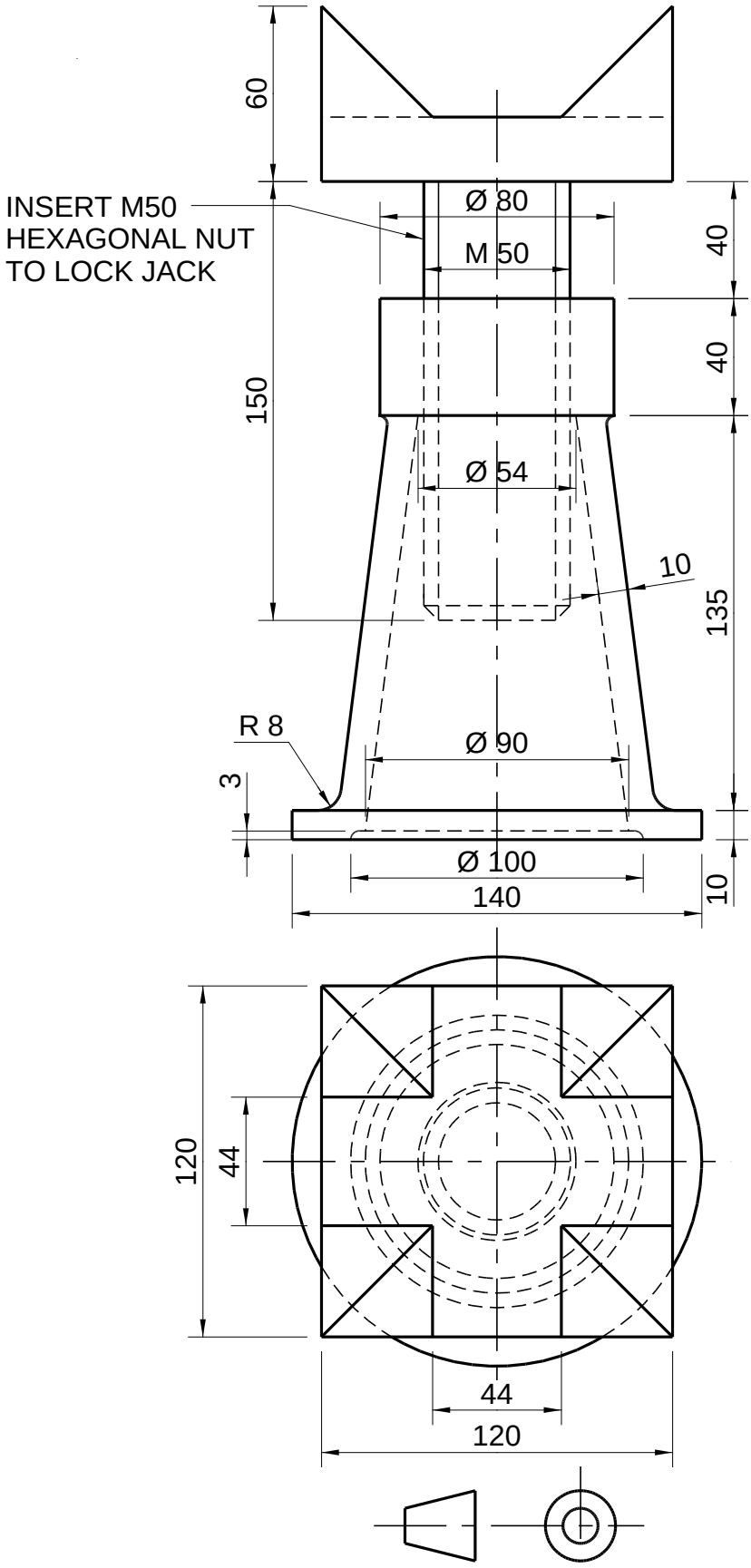


FIGURE 3

[24]

Downloaded from www.mycourses.co.za

QUESTION 4: ISOMETRIC

FIGURE 4 shows two views of a machine component drawn in first-angle orthographic projection.

Do NOT draw the two given views, but draw, to scale 1:1, an isometric view of the component. Point P must be the lowest point. NO hidden detail is required.

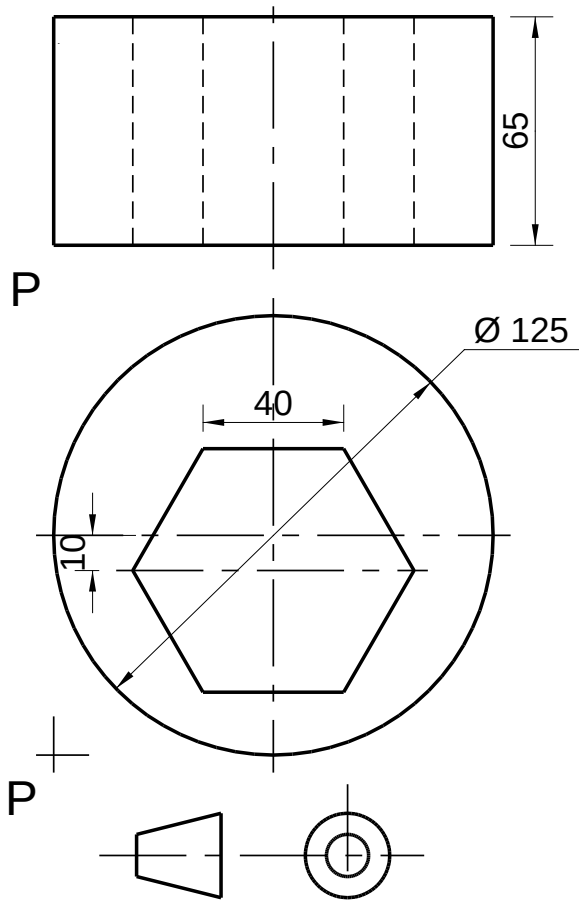


FIGURE 4 **[13]**

Downloaded from www.mycourses.co.za

QUESTION 5: INTERPENETRATION

FIGURE 5 shows two views of a circular pipe and equilateral triangular pipe without interpenetration lines in first-angle orthographic projection.

Redraw, to scale 1:1, the TWO given views in first-angle orthographic projection and show the following:

5.1 The interpenetration curve on the front view

5.2 ALL construction lines needed to project the curve of interpenetration

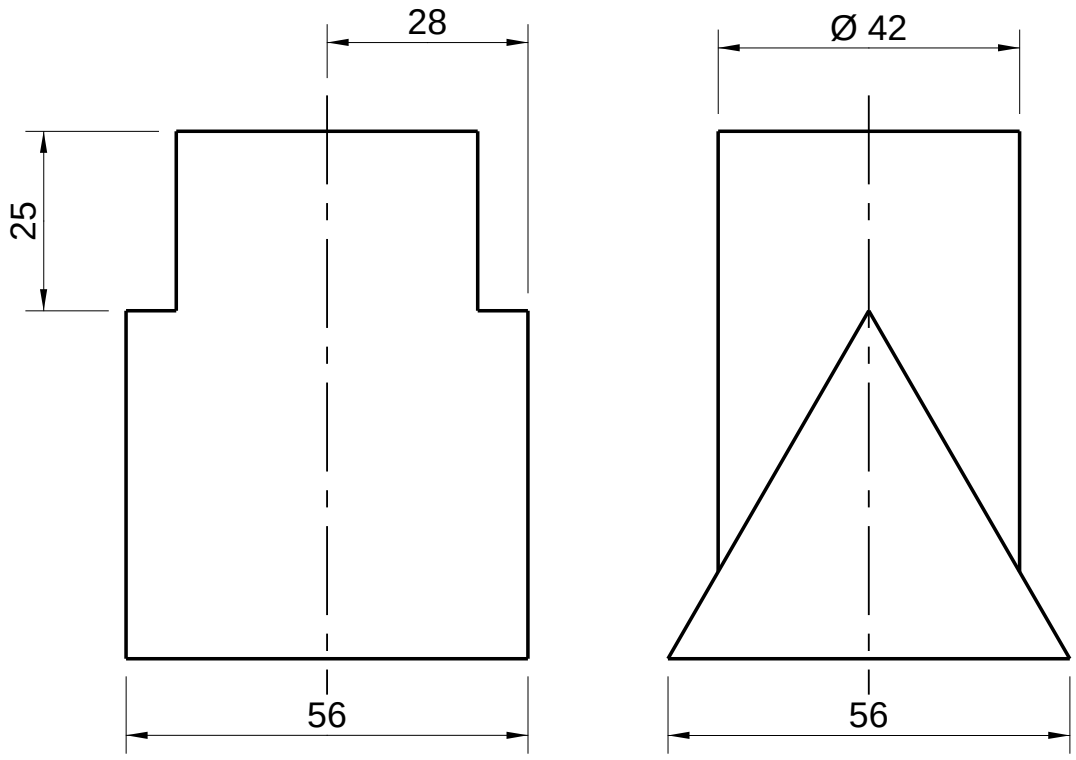


FIGURE 5 **[13]**

Downloaded from www.mycourses.co.za

QUESTION 6: THIRD-ANGLE ORTHOGRAPHIC PROJECTION AND MACHINE SYMBOLS

FIGURE 6, on the next page, shows a front view and a right view of a shaft bracket in third-angle orthographic projection.

Draw, to scale 1:1 the following views in third-angle orthographic projection:

6.1 An outside front view (6)

6.2 A sectional right view on cutting plane B-B (6)

6.3 A sectional top view on cutting plane A-A (8)

6.4 Insert the third-angle orthographic projection symbol below the title and scale. (1)

Layout, neatness, line work and accuracy (2)

Copyright reserved

Downloaded from www.mycourses.co.za

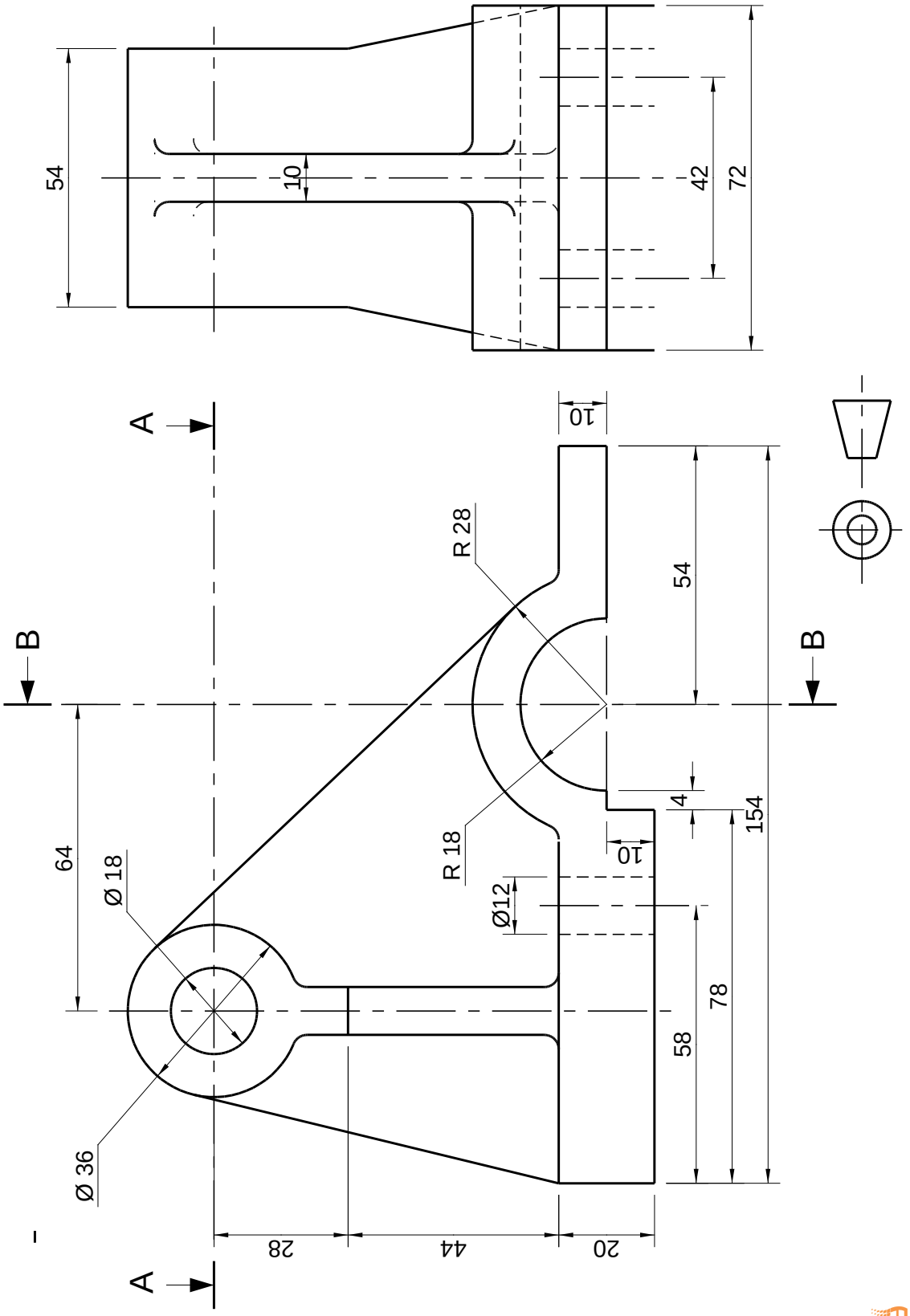


FIGURE 6

[23]

TOTAL: 100

Copyright reserved

Downloaded from www.mycourses.co.za