BOARD OF STUDIES
NEW SOUTH WALES

STUDENT NUMBER

CENTRE NUMBER

HIGHER SCHOOL CERTIFICATE EXAMINATION

1995

INDUSTRY STUDIES

2 UNIT

METAL AND ENGINEERING STRAND

SECTION II

(30 Marks)

Total time allowed for Sections I and II—One hour and a half
(Plus 5 minutes' reading time)

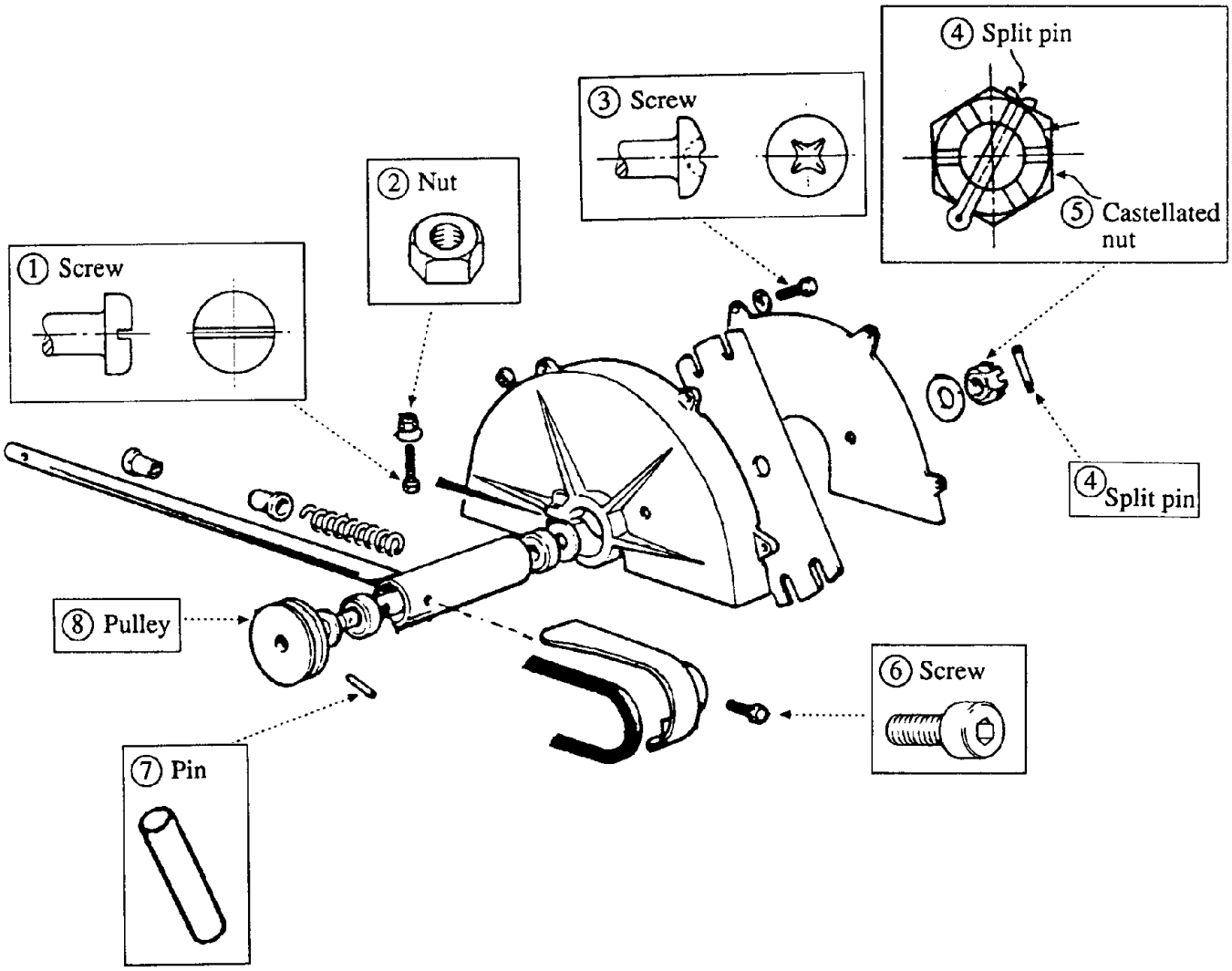
DIRECTIONS TO CANDIDATES

- Write your Student Number and Centre Number at the top right-hand corner of this page and page 13.
- Questions 1 and 2 are COMPULSORY.
- Attempt ONE question from Questions 3, 4, and 5.
- Answer the questions in the spaces provided in this paper.
- Board-approved calculators may be used.

QUESTION 1. This question is COMPULSORY. (7 marks)

(a) An exploded assembly-drawing of part of a lawn-edging machine is shown in Figure 1 below.

Complete the table provided on page 3. Name the most technically correct tools that could be used to disassemble the items listed.



Official Victa Workshop Manual, Gregory's Scientific Publications, 1986.
Reproduced with permission of Universal Press.

FIG. 1. LAWN-EDGING MACHINE

QUESTION 1. (Continued)

	Item	*Tools used for disassembly*
1	screw	
2	nut	
3	screw	
4	split pin	
5	castellated nut	
6	screw	
7	tubular pin	
8	pulley	

Question 1 continues on page 4

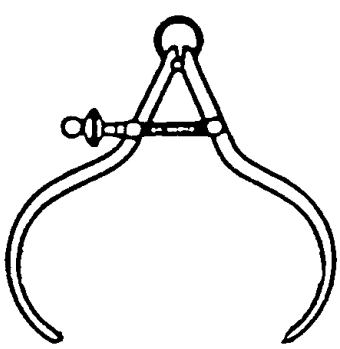
QUESTION 1. (Continued)

(b) Three tools, *A*, *B*, and *C*, are shown in Figure 2 below.

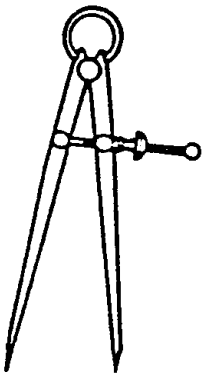
In the table below:

(i) state the name of each tool;

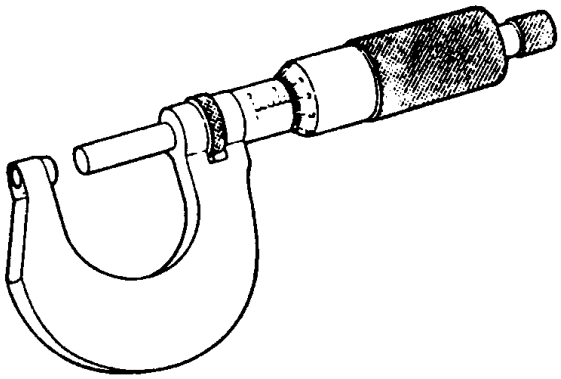
(ii) describe a use, and state the reason for selecting the tool.



A



B



Hand and Power Tools,
TAFE Engineering Services, 1991.

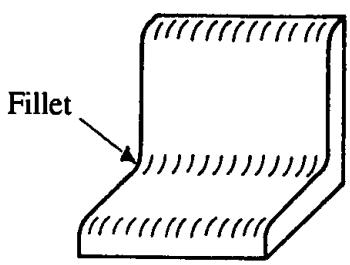
C

FIG. 2

	Name of tool	*Use and reason for selection*
A		
B		
C		

QUESTION 2. This question is COMPULSORY. (11 marks)

(a) (i)

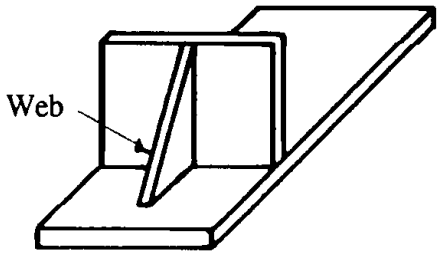


Why is a fillet used in the production of castings and forgings?

.....

.....

(ii)

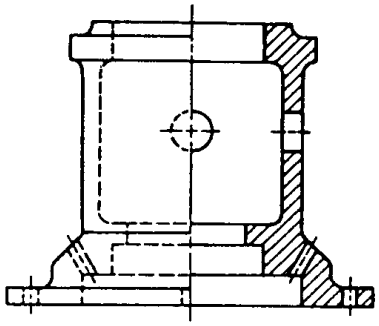


Why is a web used in the construction of manufactured items?

.....

.....

(iii)

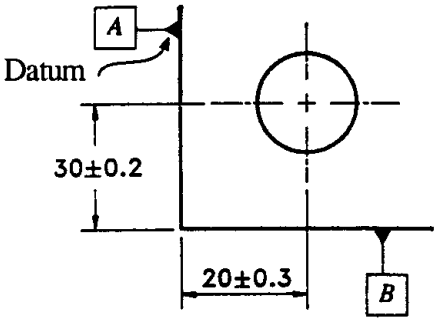


Why is a half-section view sometimes used in the preparation of orthogonal drawings?

.....

.....

(iv)

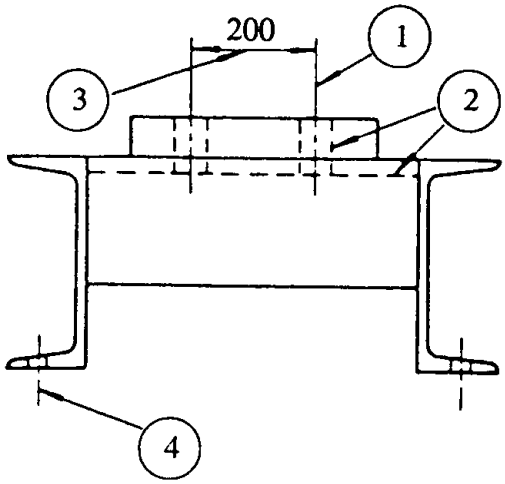


Why are datums used in the preparation of engineering drawings?

.....

.....

(b) Refer to the drawing below. Name each type of line indicated.



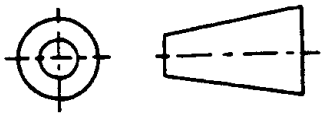
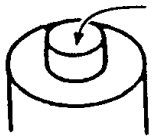
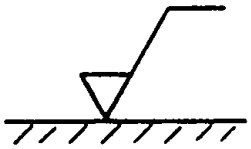
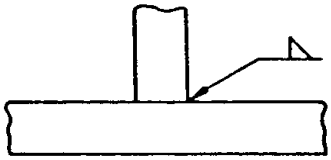
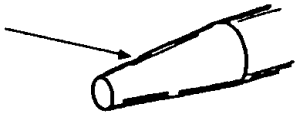
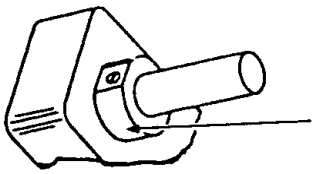
1. .....
2. .....
3. .....
4. .....

Diagrams 2ai-iv:
NSW Module Resource manual for National Metal & Engineering Courses, TAFE Engineering Services, 1990.

Question 2 continues on page 6

QUESTION 2. (Continued)

(c) Complete the table below. Give the correct technical term for each of the symbols and abbreviations shown.

	Conventional representation	*Technical term*
(i)	Example 	third-angle projection
(ii)		
(iii)		
(iv)		
(v)		
(vi)		
(vii)		
(viii)		
(ix)		

Diagrams i-ix: *NSW Module Resource Manual for National Metal & Engineering Courses*, TAFE Engineering Services, 1990.

QUESTION 2. (Continued)

(d) Refer to the object shown in Figure 3 below. This object is to be viewed in the direction of the arrow and from the right.

Which of the following (A, B, C, or D) is the correct view? Place an X in the box beside the correct view.

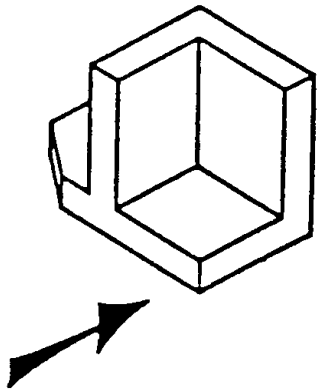
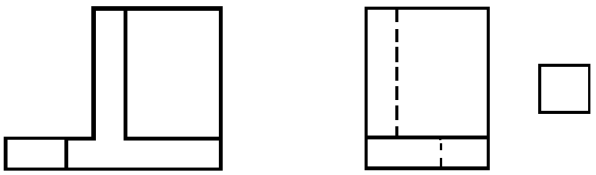


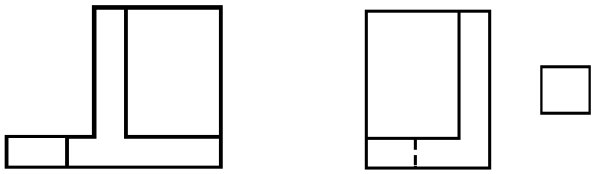
FIG. 3

(A)



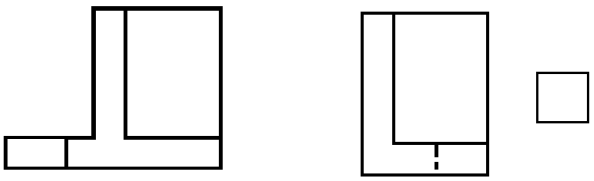
View from front View from right

(B)



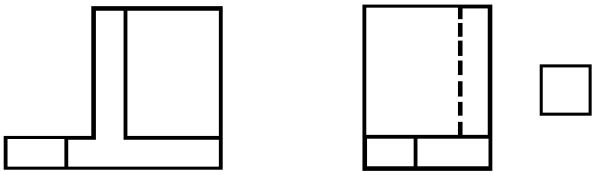
View from front View from right

(C)



View from front View from right

(D)

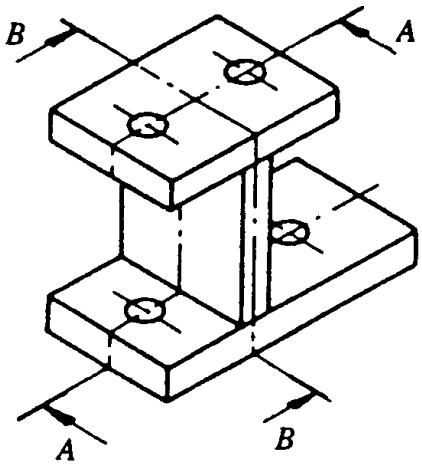


View from front View from right

Question 2 continues on page 8

QUESTION 2. (Continued)

(e) Refer to the assembled component shown in Figure 4 below. Place an X in the box to show the correct view for each of the cutting planes, *AA* and *BB*.



NSW Module Resource Manual for National Metal & Engineering Courses, TAFE Engineering Services, 1990.

FIG. 4

Section AA	*Section BB*

QUESTION 2. (Continued)

(f) Refer to the drawing of the spanner shown in Figure 5 below. Complete the following statements.

(Neat lettering and appropriate engineering terminology should be used.)

(i) The main feature is a ..... -shaped hole.

(ii) The hole measures 30 millimetres .....

(iii) The overall length is ..... millimetres.

(iv) The overall width is ..... millimetres.

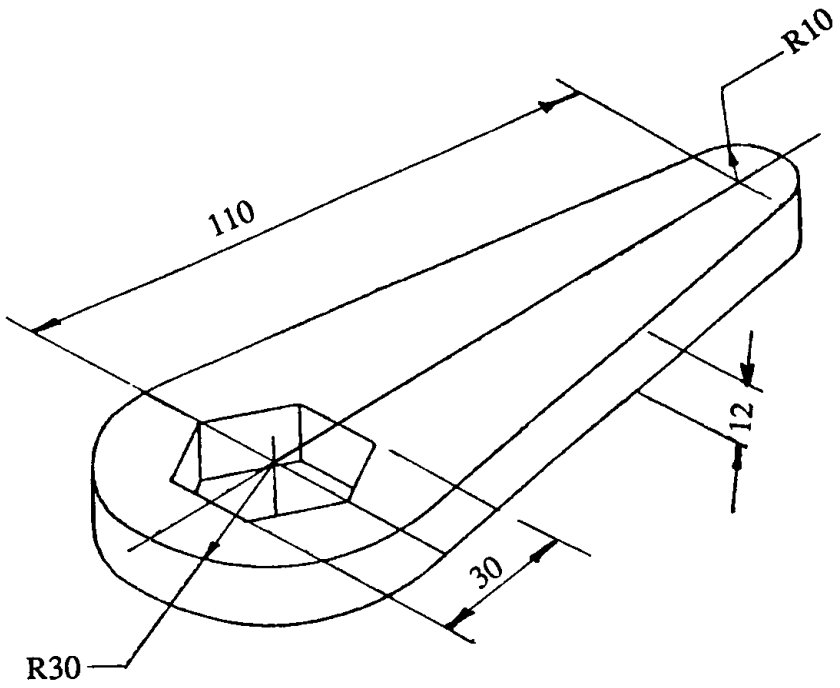


FIG. 5. SPANNER M.S.

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EXAMINER'S USE ONLY

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INDUSTRY STUDIES
METAL AND ENGINEERING STRAND—SECTION II

QUESTIONS 3, 4, and 5.

Attempt ONE question from Questions 3, 4, and 5.

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EITHER

QUESTION 3. (12 marks)

Details of a trip catch are shown in Figure 6 below. Using the starting-point *A* (as indicated below), make an accurate full-size drawing of the trip catch. Use correct geometrical construction to locate all centres and limiting points. Construction lines are not to be erased.

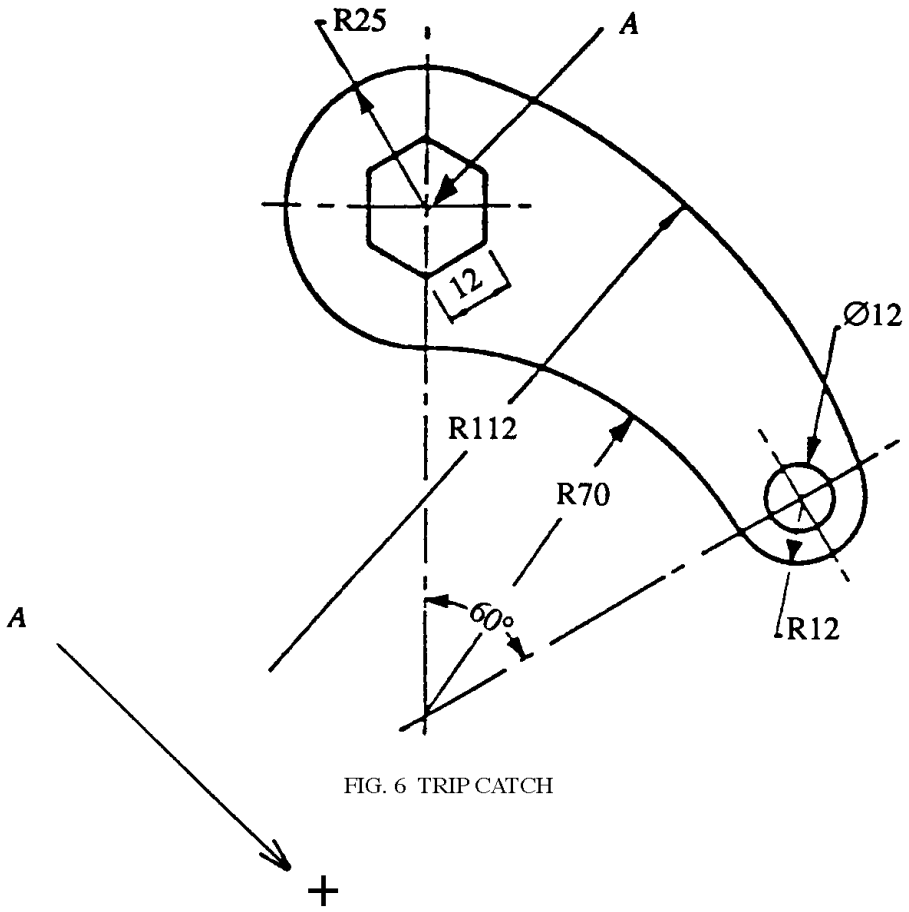

FIG. 6 TRIP CATCH

OR

QUESTION 4. (12 marks)

Details of a cast-iron bracket are given in Figure 7 below.

(a) You are to draw the top, front, and side views of the bracket. Your drawings are to be half full-size, freehand, and in third-angle orthogonal projection.

NOTE

- The top view is to be seen in the direction of arrow *A*.
- The front view is to be seen in the direction of arrow *B*.
- The side view is to be seen in the direction of the arrow *C*.

(b) Show all hidden detail.

(c) Fully dimension the bracket.

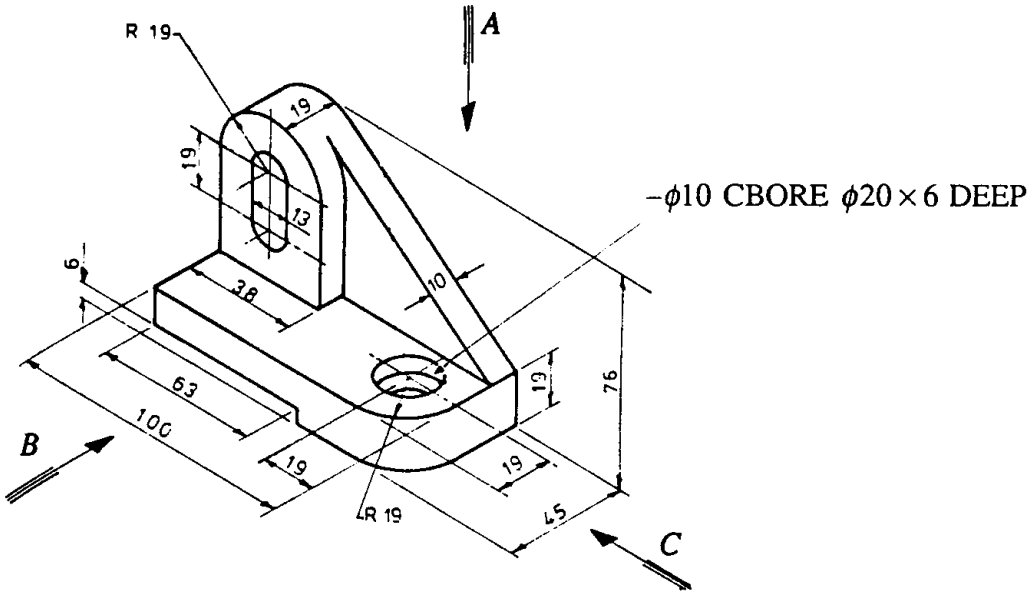

FIG. 7. CAST IRON BRACKET

OR

QUESTION 5. (12 marks)

The top and front views of a forked bracket are shown in Figure 8. In the space provided below, draw a full-size, freehand, oblique sketch of the forked bracket when viewed from the direction indicated by the arrow.

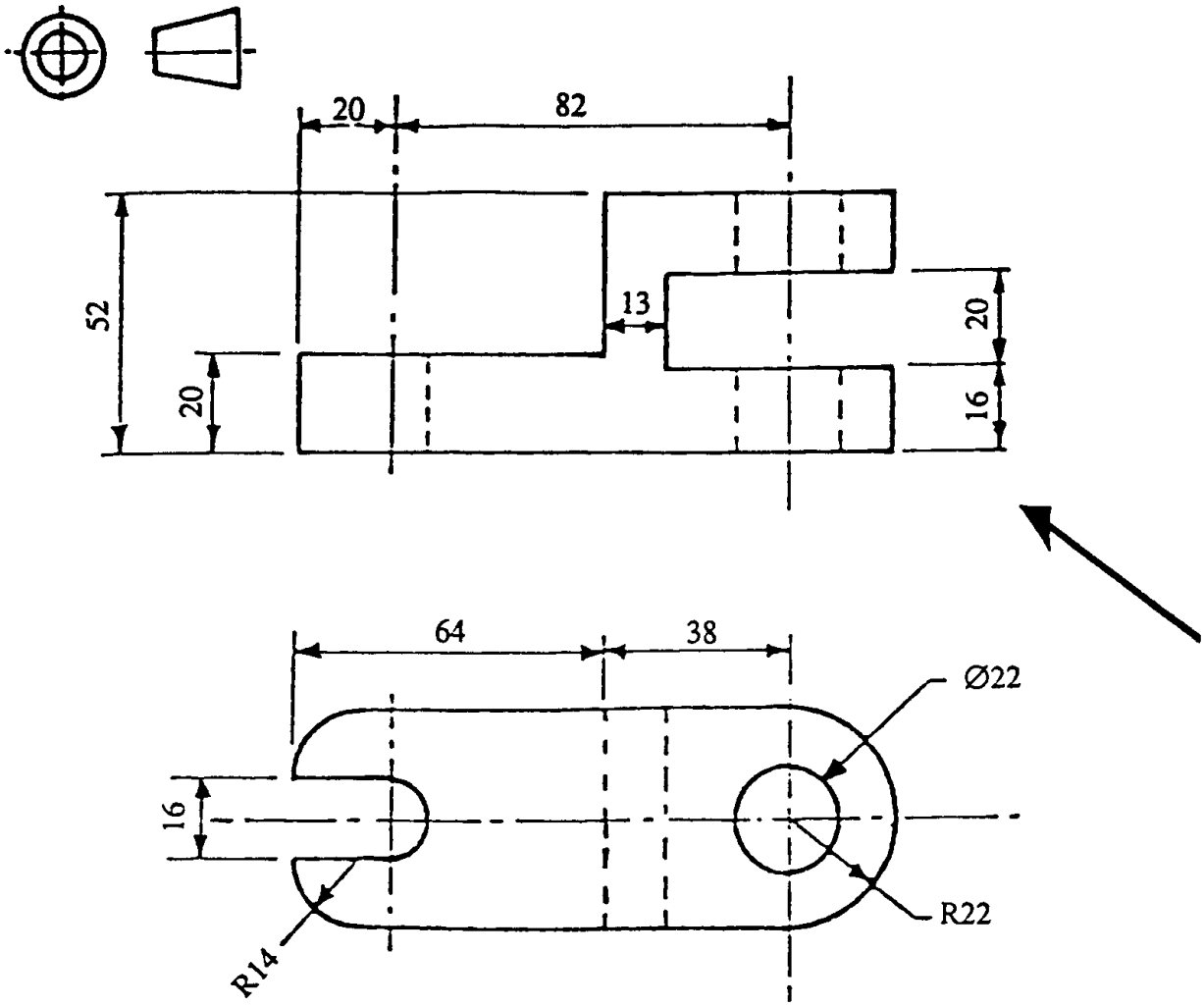

FIG. 8. FORKED BRACKET