

Academic Challenge



EASTERN ILLINOIS UNIVERSITY

2019 Academic Challenge

ENGINEERING GRAPHICS TEST – REGIONAL

Engineering Graphics Test Production Team

Ryan Brown, Illinois State University – Author/Team Leader

Ted Branoff, Illinois State University – Reviewer

GENERAL DIRECTIONS

Please read the following instructions carefully. This is a timed test; any instructions from the test supervisor should be followed promptly.

The test supervisor will give instructions for filling in any necessary information on the answer sheet. Most Academic Challenge sites will ask you to indicate your answer to each question by marking an oval that corresponds to the correct answer for that question. One oval should be marked to answer each question. Multiple ovals will automatically be graded as an incorrect answer.

Be sure ovals are marked as  , not  ,  ,  , etc.

If you wish to change an answer, erase your first mark completely before marking your new choice.

You are advised to use your time effectively and to work as rapidly as you can without losing accuracy. Do not waste your time on questions that seem too difficult for you. Go on to the other questions, and then come back to the difficult ones later if time remains.

Time: 40 Minutes

Number of Questions: 40

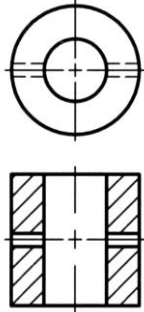
DO NOT OPEN TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO!

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Academic Challenge
Engineering Graphics Test (Regional) - 2019

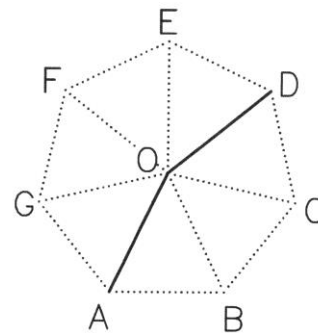
1. In the illustration below, which standardized type of line is **NOT** featured?



- A. Visible line
 B. Center line
 C. Hidden line
 D. Section line
 E. All of the above ARE featured
2. Which of the following measuring devices would be used to measure a factory layout drawing if the scale of the drawing is 1" = 40'?
- A. Architect's scale
 B. Civil engineer's scale
 C. Mechanical engineer's scale
 D. Landscape architect's scale
 E. Triangular metric scale
3. Which of the following ratios matches the scale indicated in the title block of the drawing as $3/8" = 1'-0"$?
- A. 1:16
 B. 1:24
 C. 1:32
 D. 1:48
 E. 1:64

4. Two complete circles are _____ to each other when they make contact at one and only one point.
- A. concentric
 B. parallel
 C. eccentric
 D. perpendicular
 E. tangent
5. What is the sum total of the interior angles of an octagon?
- A. 720°
 B. 900°
 C. 1080°
 D. 1260°
 E. 1440°

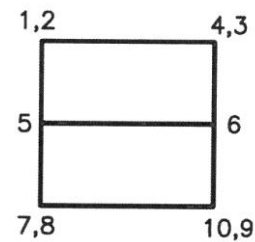
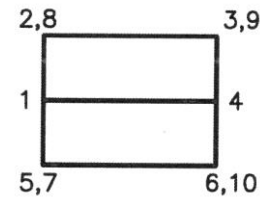
6. Identify the number of degrees (less than 180°) for angle A-O-D?



- A. 102.9°
 B. 120.0°
 C. 135.0°
 D. 154.3°
 E. 172.0°

7. Which of the following describes the theory of standardized multiview projection?
- Parallel projectors perpendicular to projection planes
 - Perspective projectors perpendicular to projection planes
 - Parallel projectors parallel to projection planes
 - Parallel projectors oblique to projection planes
 - Perspective projectors oblique to projection planes
8. Given a right **heptagonal** prism, resting on the ground so that the top view features the shape; and the front view features one side as a normal surface, how many **hidden** lines are there in the other views, if any?
- 0
 - 1
 - 2
 - 3
 - 4
9. In an engineering graphics text, what would be explained within a section entitled **Precedence of Lines**?
- How to create center lines for curved features
 - How to draw visible lines thin
 - How to draw fillets and rounds
 - How to connect hidden lines to visible lines
 - What to do if visible lines coincide with hidden lines or center lines

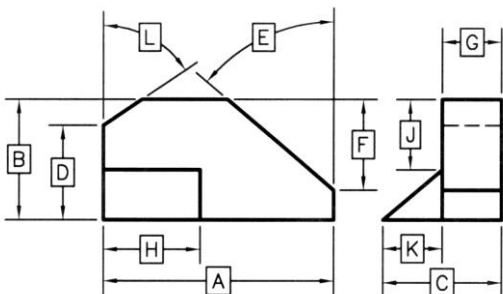
10. In engineering graphics, it is common to number the vertices of an object in order to help solve a problem. Based on this front view and top view, what numbers would be used to identify the bottom right corner of the right side view (not shown)?



- 3,2
 - 9,8
 - 4,1
 - 6,5
 - 10,7
11. Which type of section view is best suited to show the cross-sectional shape of a spoke, super-imposed directly onto the longitudinal view of the spoke?
- Revolved section
 - Aligned section
 - Removed section
 - Offset section
 - Half section

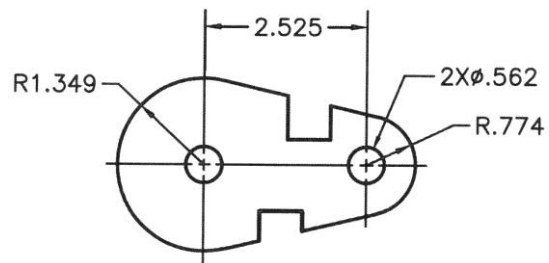
17. What is the **pitch** for a 5/8-18 UNF-2A thread?
- .125"
 - .625"
 - 1/18"
 - .188"
 - .200"
18. In the previous question, what does the "F" stand for?
- Fillister
 - Full
 - Fillet
 - Fastener
 - Fine
19. Fill in both blanks with one appropriate word that best fills in the description of computer modeling:
- According to the Wikipedia™,
- "In CAD software or 3D modeling, the interface may present the user with the ability to create a _____, which may be further modified by edits. For example, in the practice of box modeling the user will start with a cuboid, then use extrusion and other operations to create the model. In this use, the _____ is just a convenient starting point, rather than the fundamental unit of modeling."*
- line
 - block
 - torus
 - node
 - primitive
20. On an engineering print, what type of note expresses a condition that applies to the entire part?
- General note
 - Conditional note
 - Local note
 - Specification note
 - Leadered note
21. If a hole dimension is given at .672-.684 and the mating part is a shaft with a dimension of .650 +/- .015, what is the "range of fit" for the two parts?
- .019-.037
 - .007-.037
 - .012-.020
 - .007-.049
 - .019-.049
22. A computer data point identified by an X-Y-Z value is logically associated with a _____.
- virtue
 - verdict
 - vertex
 - vector
 - vortex

23. The drawing below contains at least one superfluous dimension. Of the answer choices below, which one could be eliminated?



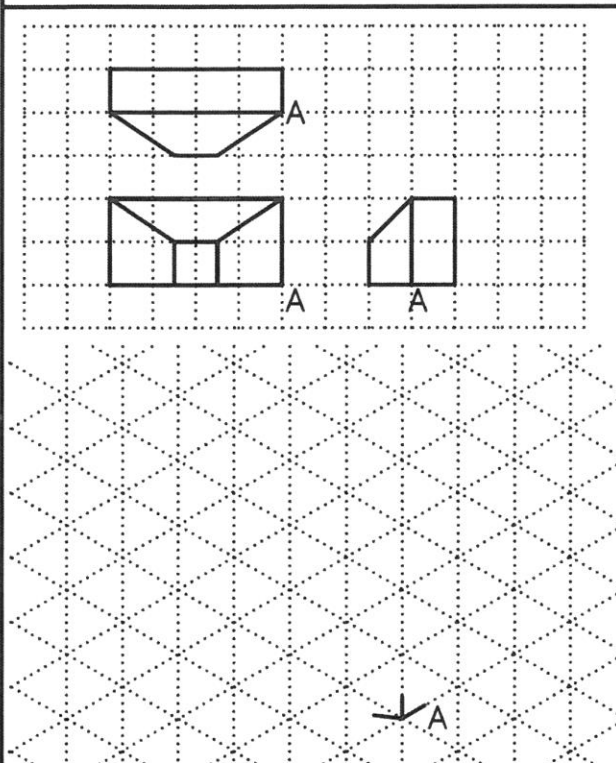
- A. A
- B. B
- C. C
- D. D
- E. E

24. For this gasket drawing, how many additional dimensions are required in this view?

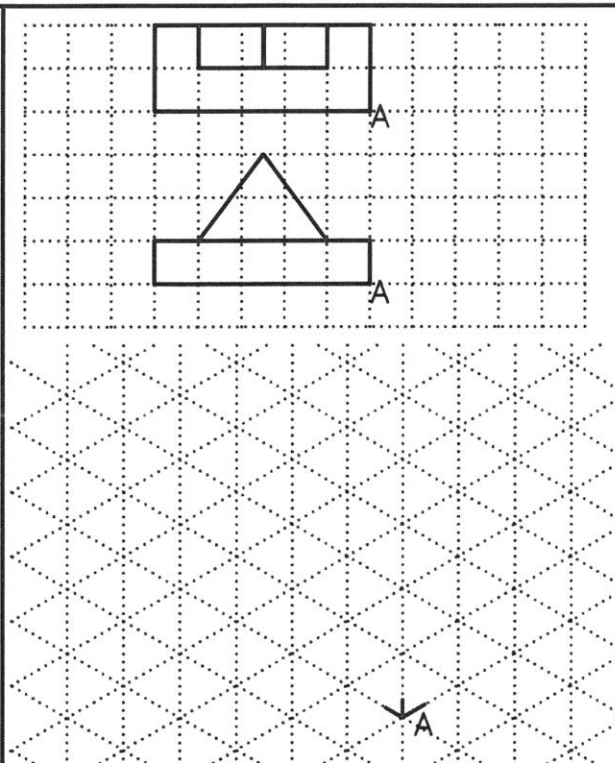


- A. 2
- B. 3
- C. 4
- D. 5
- E. 6

PROBLEMS 25 & 26: CREATE ISOMETRIC SKETCHES
 SELECT AN ANSWER THAT REPRESENTS THE NUMBER OF SEGMENTS REQUIRED

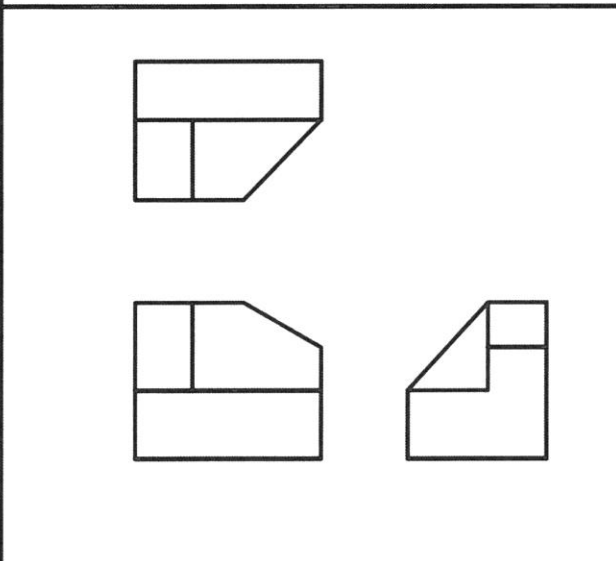


25. NUMBER OF LINE SEGMENTS:
 A. 14 B. 15 C. 16 D. 17 E. 18

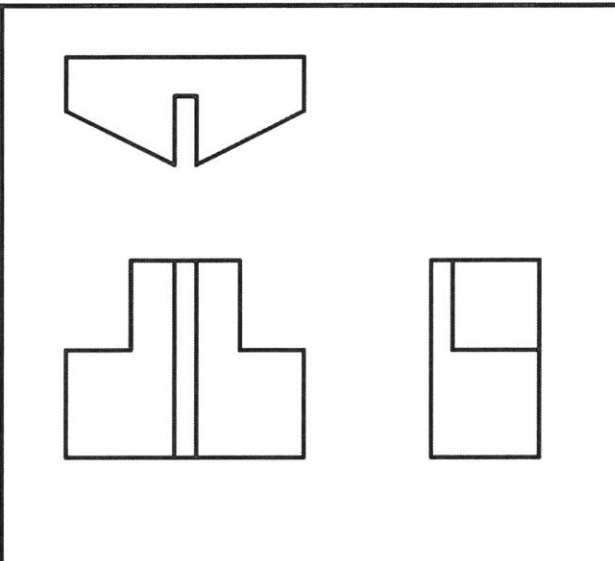


26. NUMBER OF LINE SEGMENTS:
 A. 13 B. 14 C. 15 D. 16 E. 17

PROBLEMS 27 & 28: MISSING LINE PROBLEMS: SELECT AN ANSWER THAT
 CORRESPONDS WITH THE LEAST NUMBER OF LINE SEGMENTS (VISIBLE AND/OR
 HIDDEN) STILL NEEDED TO CREATE A CORRECT AND VALID MULTIVIEW DRAWING

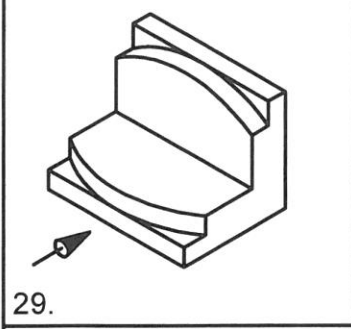


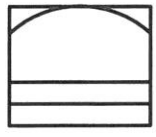
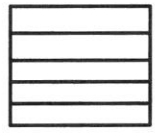
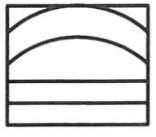
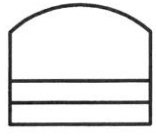
27. MINIMUM NUMBER OF LINES:
 A. 2 B. 3 C. 4 D. 5 E. 6

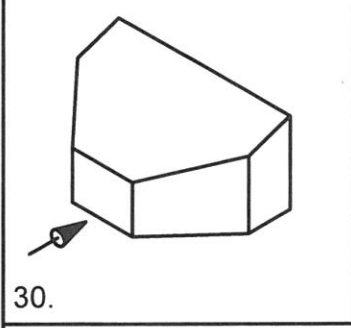


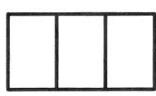
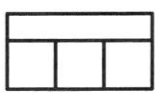
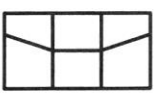
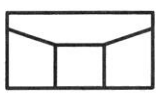
28. MINIMUM NUMBER OF LINES:
 A. 2 B. 3 C. 4 D. 5 E. 6

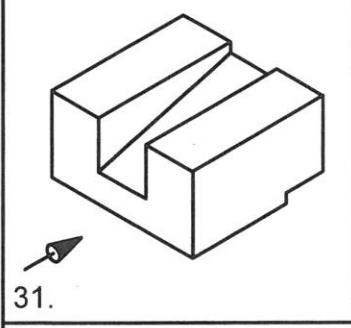
FOR EACH PROBLEM ON THIS PAGE, SELECT A FRONT VIEW
NOTE: CENTER LINES OMITTED ON THIS TEST

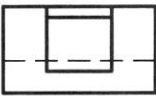

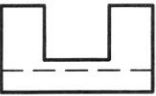



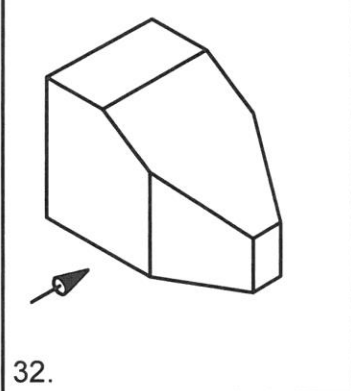
- 
A.
- 
B.
- 
C.
- 
D.
- E. NONE OF THESE

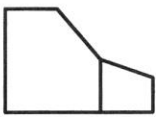
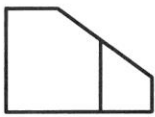
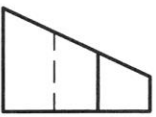
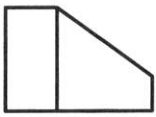


- 
A.
- 
B.
- 
C.
- 
D.
- E. NONE OF THESE



- 
A.
- 
B.
- 
C.
- 
D.
- E. NONE OF THESE

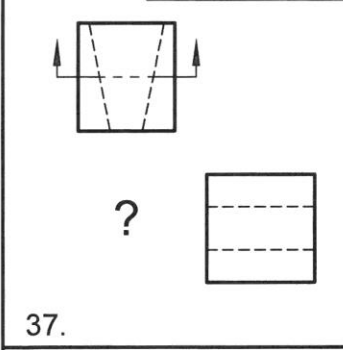


- 
A.
- 
B.
- 
C.
- 
D.
- E. NONE OF THESE

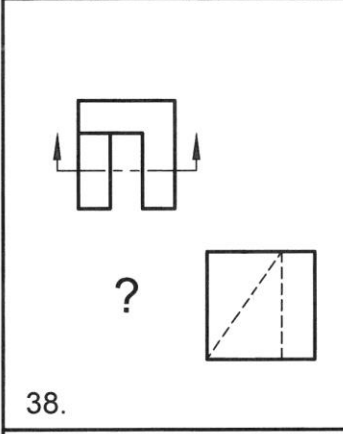
FOR EACH PROBLEM ON THIS PAGE, SELECT A SIDE VIEW
NOTE: CENTER LINES OMITTED ON THIS TEST

<p>33.</p> <p>?</p>	<p>A. </p> <p>B. </p> <p>C. </p> <p>D. </p> <p>E. NONE OF THESE</p>
<p>34.</p> <p>?</p>	<p>A. </p> <p>B. </p> <p>C. </p> <p>D. </p> <p>E. NONE OF THESE</p>
<p>35.</p> <p>?</p>	<p>A. </p> <p>B. </p> <p>C. </p> <p>D. </p> <p>E. NONE OF THESE</p>
<p>36.</p> <p>?</p>	<p>A. </p> <p>B. </p> <p>C. </p> <p>D. </p> <p>E. NONE OF THESE</p>

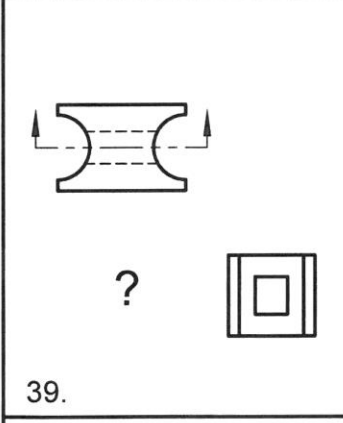
FOR EACH PROBLEM ON THIS PAGE, SELECT A FRONT SECTIONAL VIEW
NOTE: CENTER LINES OMITTED ON THIS TEST



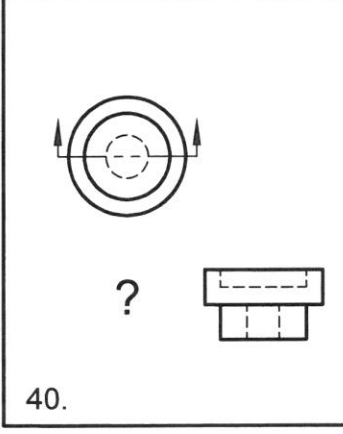
- A.
- B.
- C.
- D.
- NONE
OF
THESE
E.



- A.
- B.
- C.
- D.
- NONE
OF
THESE
E.



- A.
- B.
- C.
- D.
- NONE
OF
THESE
E.



- A.
- B.
- C.
- D.
- NONE
OF
THESE
E.

