



2014 Academic Challenge

ENGINEERING GRAPHICS TEST – REGIONAL

– This Test Consists of 40 Questions –

Engineering Graphics Test Production Team

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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 *****

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

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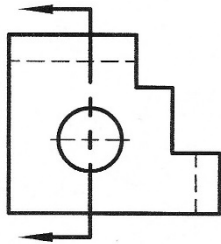
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WYSE – Academic Challenge
Engineering Graphics Test (Regional) - 2014

1. Which of the textbook titles below would LEAST likely have chapter titles such as **Orthographic Projection**, **Auxiliary Views**, **Dimensioning**, and **Tolerancing**?

- A. Print Reading for Industry
- B. Technical Drawing
- C. Engineering Graphics
- D. Mechanical Drafting
- E. Print Reading for Construction

2. As listed in the ASME standards, which one of the following line types is NOT featured in the illustration below?

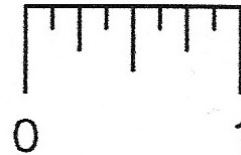


- A. Section
- B. Hidden
- C. Center
- D. Visible
- E. Dimension

3. While 12" x 18", 18" x 24", and 24" x 36" are standard paper sizes in the field of _____, these sizes are not usually used in the engineering graphics field.

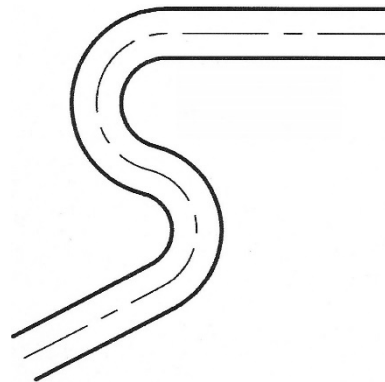
- A. accounting
- B. architecture
- C. journalism
- D. economics
- E. oceanography

4. How many more division tick marks would need to be added to the 1" scale illustrated below if it were divided to the nearest 1/32"?



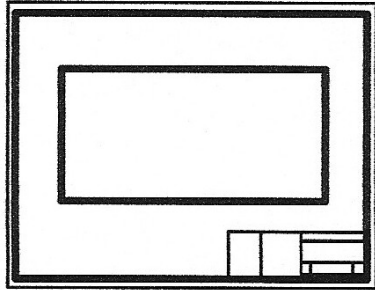
- A. 8
- B. 12
- C. 16
- D. 24
- E. 32

5. For this section of road, the line segments and arcs that form the centerline have been "offset" each side to form the road edges. Altogether, how many "points of tangency" are featured by this geometric construction?



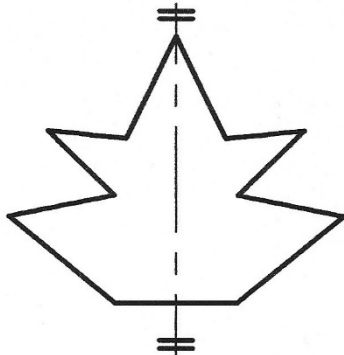
- A. 3
- B. 6
- C. 9
- D. 12
- E. 15

6. The 2 meter by 1 meter sheet metal design was scaled to fit on a standard 8.5" x 11" sheet of paper. Which of the following scales matches the illustration?



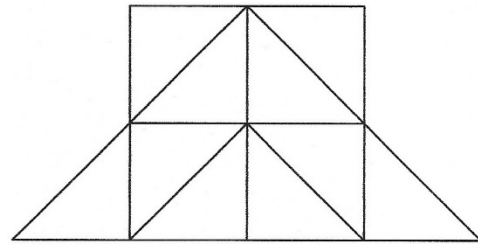
- A. 1:2
- B. 1:10
- C. $1/4" = 1'-0"$
- D. 1:100
- E. 1:1000

7. The geometric shape shown below exhibits _____.



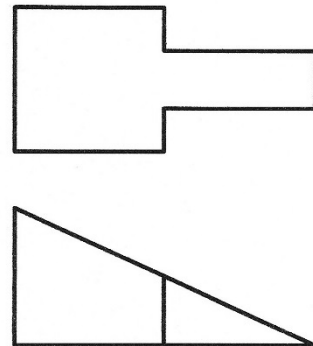
- A. symmetry
- B. concentricity
- C. perpendicularity
- D. eccentricity
- E. parallelism

8. Within this geometric design, using all lines in any arrangement, how many right triangles are there?



- A. 10
- B. 11
- C. 12
- D. 13
- E. 14

9. In engineering graphics, it is common to number the vertices of an object in order to help solve a problem. How many unique vertices does this object have?

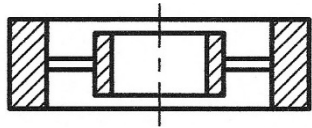


- A. 14
- B. 15
- C. 16
- D. 17
- E. 18

10. In engineering graphics education, it is common to explain the orthographic projection of the front, top, and right side views of an object onto projection planes. What names are usually assigned to the three projection planes?

- A. Vertical, Horizontal, and Inclined
- B. Normal, Horizontal, and Inclined
- C. Isometric, Oblique, and Perspective
- D. Frontal, Horizontal, and Profile
- E. Visible, Center, and Hidden

11. By examining the section view below, what conclusion, if any, can be made?

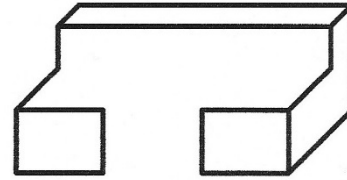


- A. The object is cylindrical, like a wheel
- B. The object has spokes
- C. The section is a half section
- D. The material is stainless steel
- E. No conclusions above are a certainty

12. At a minimum, how many line segments would be required to draw the top view and front view of a regular square-based pyramid?

- A. 8
- B. 9
- C. 10
- D. 11
- E. 12

13. The oblique pictorial drawing below is missing _____ segments.



- A. 5
- B. 6
- C. 7
- D. 8
- E. 9

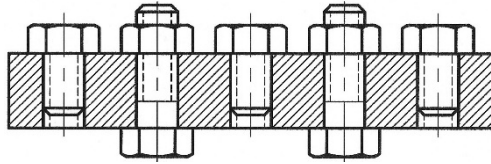
14. Which of the pictorial drawings below was created as a two-point perspective?

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

15. While many graphic software programs utilize or feature **raster**-based images, CAD programs are usually _____-based.

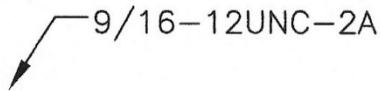
- A. pixel
- B. map
- C. dot
- D. vector
- E. spline

16. In the illustration below, how many **nuts** are shown?



- A. 2
- B. 3
- C. 5
- D. 6
- E. 7

17. What is the pitch of the thread called out by the thread note illustrated below?

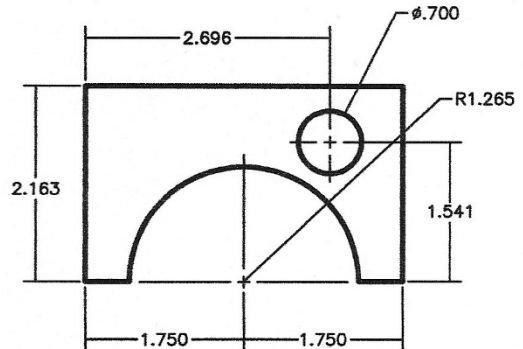


- A. 9/16
- B. 2
- C. 1/24
- D. 24
- E. 1/12

18. Which of the following would **LEAST** likely be covered by the CAD standards of an engineering department?

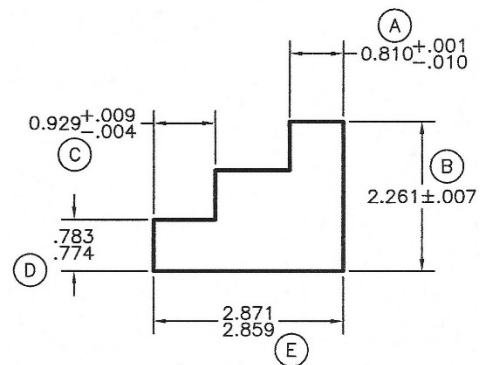
- A. Layer names
- B. Dimensioning variables
- C. Font styles
- D. Section view types
- E. Symbol component names

19. The geometric shape below has been dimensioned, but all the arrows are missing! How many arrows need to be added?



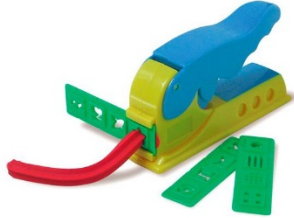
- A. 11
- B. 12
- C. 13
- D. 14
- E. 15

20. In the illustration below, which dimension has the **LARGEST** tolerance?



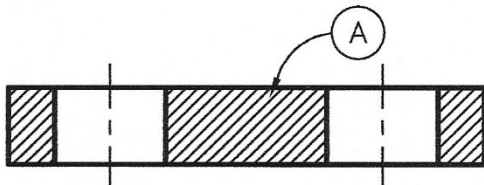
- A. A
- B. B
- C. C
- D. D
- E. E

21. The children's toy shown below works on the same principle as a manufacturing process known as _____.



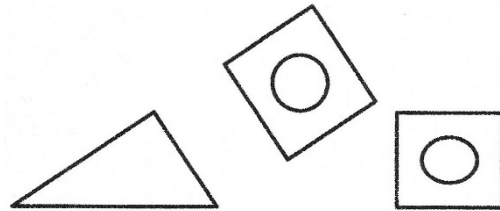
- A. knurling
- B. shearing
- C. extruding
- D. welding
- E. chopping

22. The area indicated by "A" is sometimes called hatching. What is the official ASME name for the lines used to create the hatching?



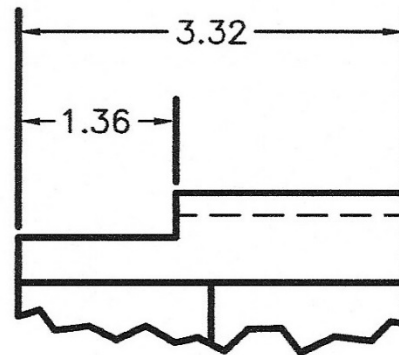
- A. Cross lines
- B. Cutting plane lines
- C. Slice lines
- D. Angle lines
- E. Section lines

23. The multiview drawing below features a hole drilled through a wedge perpendicular to an inclined surface. Therefore, the drawing includes a front view, auxiliary view, and right side view. How many **hidden** lines are missing from the three views that would make the drawing complete and correct?



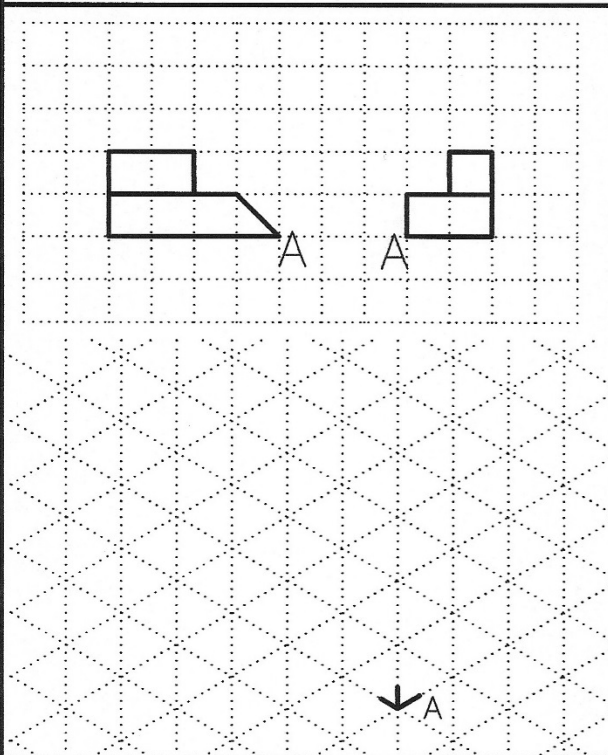
- A. 2
- B. 3
- C. 4
- D. 5
- E. 6

24. Which type of line in the illustration below is shown **poorly**, because it is either too thick or too thin?

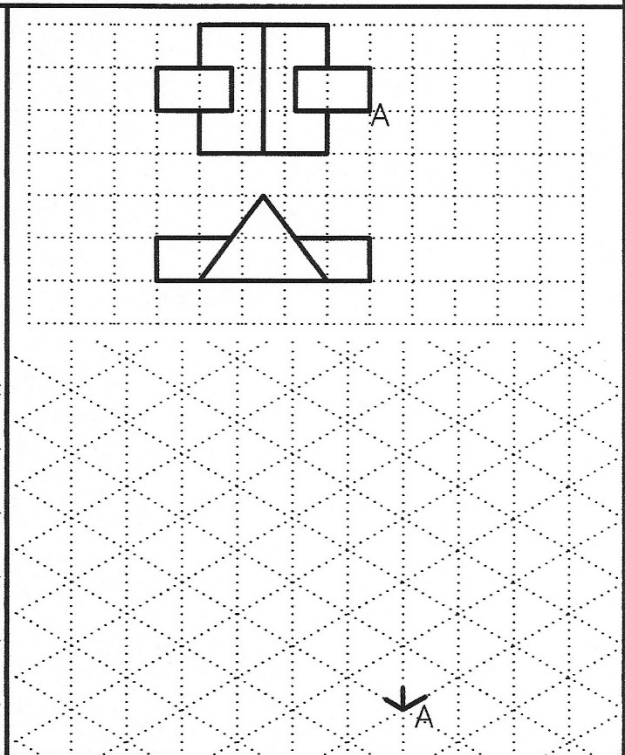


- A. Freehand break line
- B. Visible line
- C. Hidden line
- D. Extension line
- E. Dimension line

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

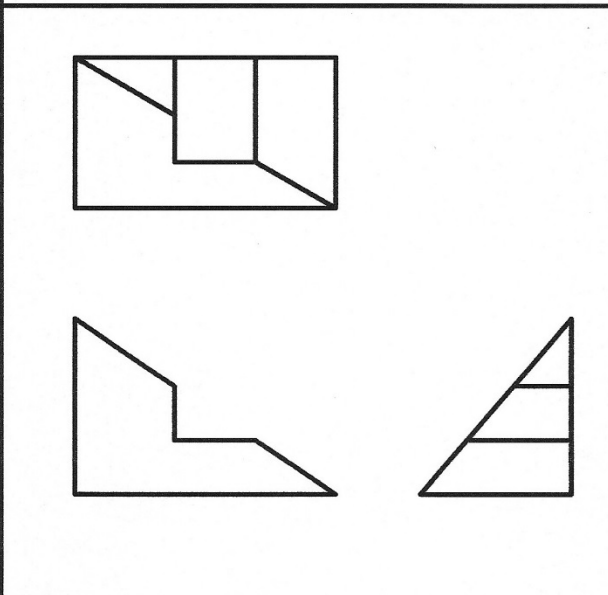


25. NUMBER OF LINE SEGMENTS:
 A. 14 B. 15 C. 16 D. 17 E. 18

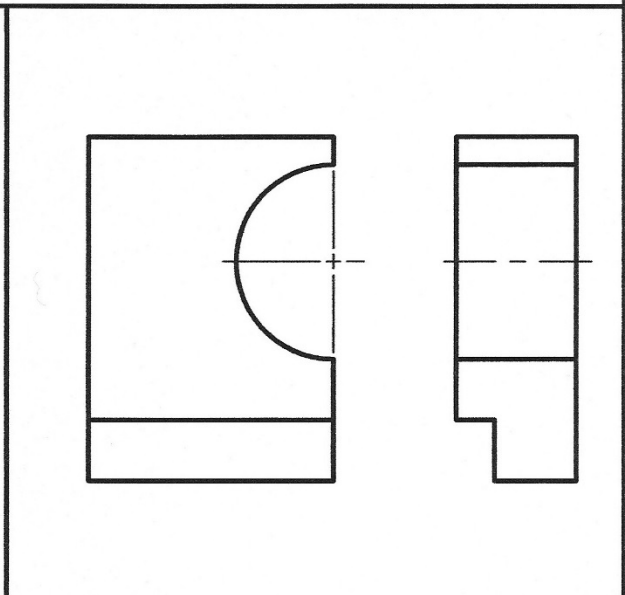


26. NUMBER OF LINE SEGMENTS:
 A. 18 B. 19 C. 20 D. 21 E. 22

PROBLEMS 27 & 28: DIMENSION THE MULTIVIEW DRAWINGS
SELECT AN ANSWER THAT REPRESENTS THE MINIMUM DIMENSIONS REQUIRED

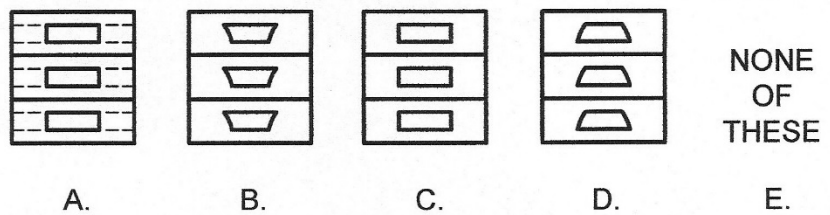
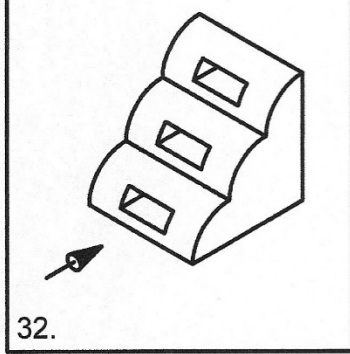
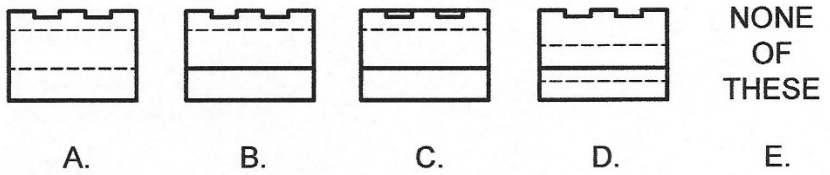
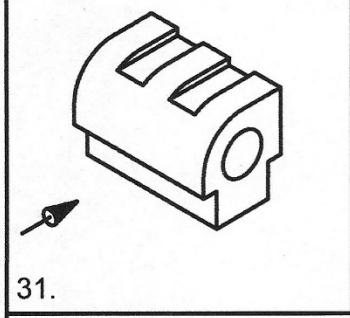
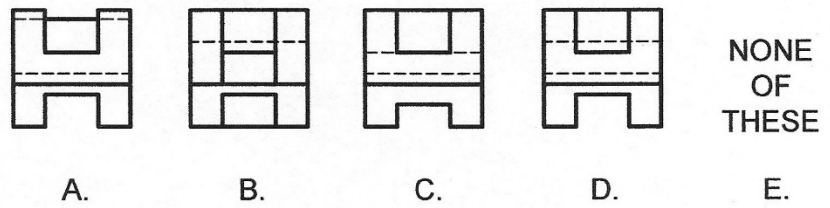
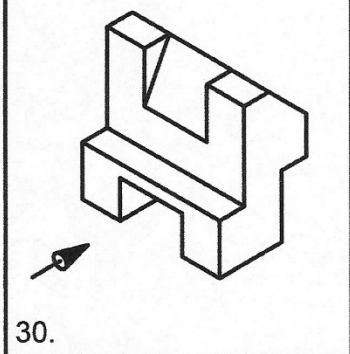
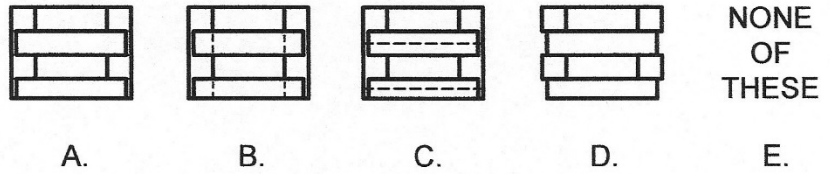
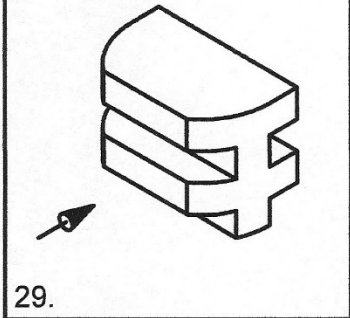


27. MINIMUM NUMBER OF DIMENSIONS:
 A. 5 B. 6 C. 7 D. 8 E. 9



28. MINIMUM NUMBER OF DIMENSIONS:
 A. 6 B. 7 C. 8 D. 9 E. 10

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



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

33.

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

34.

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

35.

?

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

36.

?

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

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

