Kansas City Area Teachers of Mathematics
2011 KCATM Math Competition

GEOMETRY AND MEASUREMENT TEST
GRADE 5

INSTRUCTIONS

- **Do not open this booklet** until instructed to do so.

- Time limit: **15 minutes**

- You **may use calculators** on this test.

- Use the π **key** on your calculator **or 3.14159** as the approximation for pi.

- Mark your answer on the Scantron sheet by **FILLING in the oval**.

- You **may not use rulers, protractors, or other measurement devices** on this test.
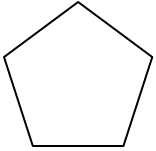
Student Name _____ Student Number _____

School _____

1. What is the **best name** for the 3-Dimensional shape:
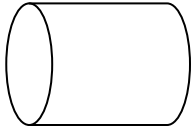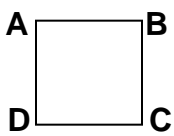
A. cone   B. pyramid   C. cylinder   D. prism
E. None of the above

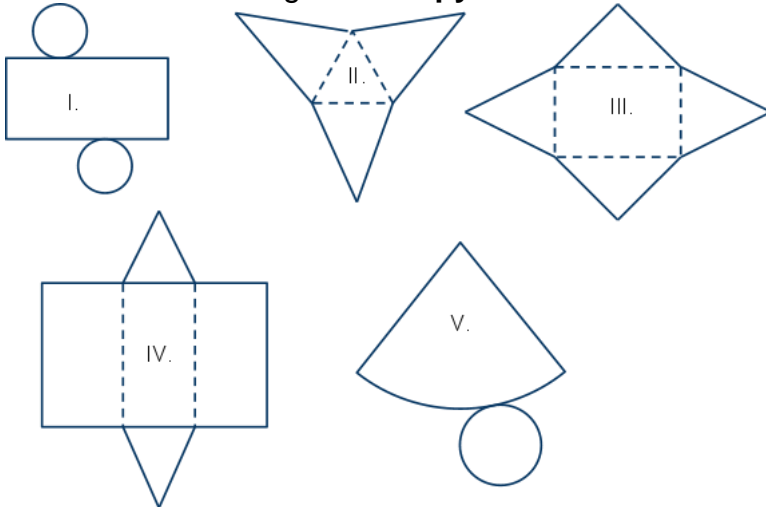2. What is the **best name** for the 2-Dimensional shape:

A. square   B. trapezoid   C. hexagon   D. pentagon
E. None of the above

3. In the square below, name a pair of **perpendicular** line segments.

A   B   A. $\overline{AB}$, $\overline{DC}$ B. $\overline{AB}$, $\overline{AD}$ C. $\overline{AB}$, $\overline{CD}$ D. $\overline{BA}$, $\overline{DC}$
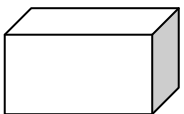E. None of the above

D   C

4. Which of the following nets are **pyramids**?

I.

II.

III.

A.   I, IV
B.   II, III, V
C.   II, II, IV
D.   II, III
E.   None of the above

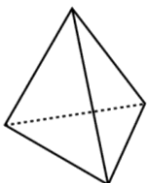IV.

V.

http://scimathmn.org

5. How many **edges** does the following rectangular prism have?
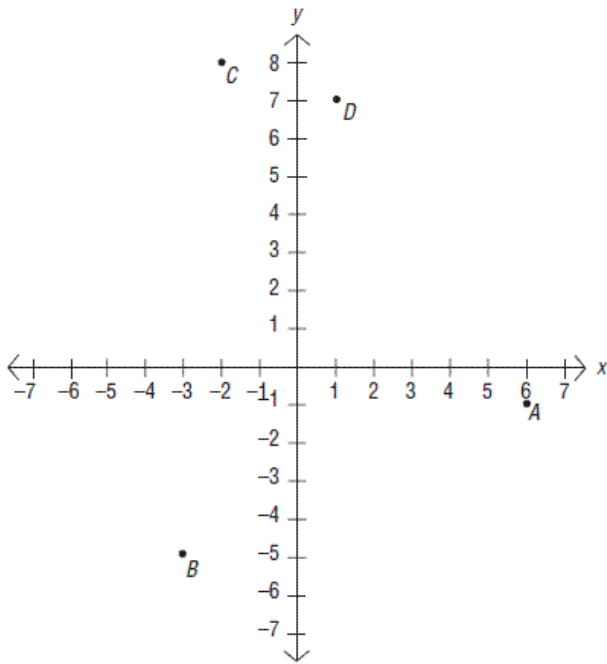
A. 9   B. 6   C. 12   D. 10   E. None of the above

6. How many **faces** does the following 3-D shape have?

A. 3   B. 4   C. 6   D. 8   E. None of the above

Use the following coordinate plane to answer questions 7-9.

7. What are the coordinates of **point B**?
   A. (-2, 8)   B. (-5, -3)   C. (6,-1)
   D. (-3, -5)   E. None of the above.

8. Which **quadrant** does Point A lie in on the graph?
   A. I   B. II   C. III
   D. IV   E. None of the above

9. Make a closed figure by connecting the points in order: A, B, C, D. What is the **best name** for the figure ABCD?
   A.   Quadrilateral
   B.   Square
   C.   Rectangle
   D.   Rhombus
   E.   None of the above

Use the following coordinate plane to answer questions 10-12.
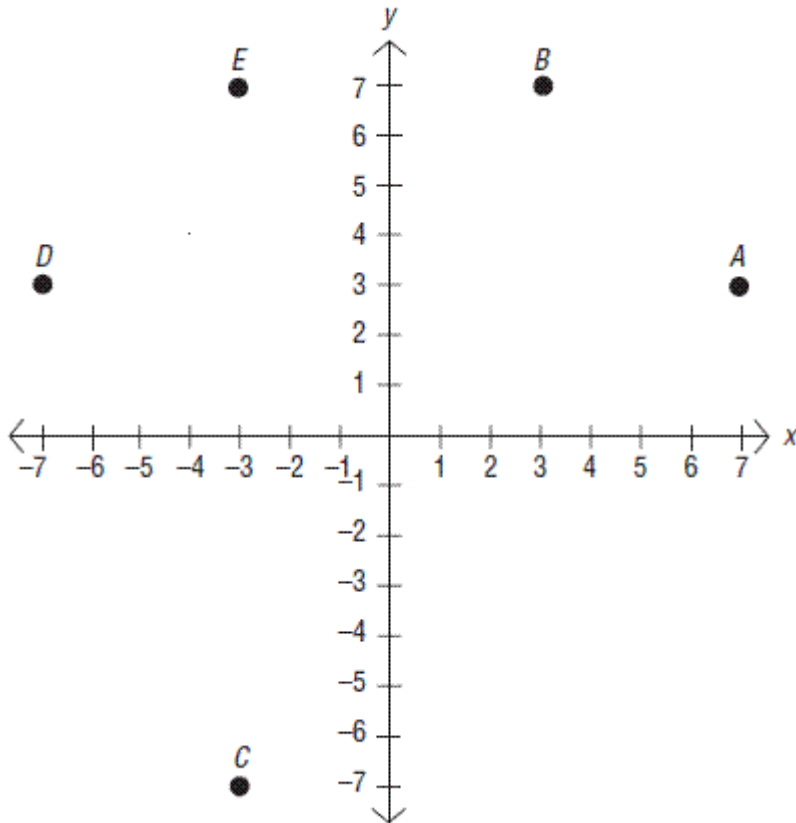
10. Give the labeled points in order.

Ordered Pair	Letter
(–3,7)	
(7,3)	
(–3,–7)	
(–7,3)	
(3,7)	

   A.   E, A, C, B, D
   B.   B, D, A, C, E
   C.   A, E, D, B, C
   D.   E, A, C, D, B
   E.   None of the above

11. Compare the lengths DE and BA.
   A. DE > BA
   B. DE < BA
   C. DE = BA
   D. BA > DE
   E. None of the above

12. Join the points A, B, E, D in order to make a closed figure. What is the **best name** for ABED?
   A. Parallelogram   B. Rectangle   C. Trapezoid   D. Triangle
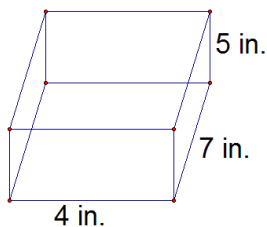   E. None of the above

13. What are the degree measures of **each angle** in rectangle?
   A. 45°   B. 60°   C. 90°   D. 180°   E. None of the above

14. What is the **sum** of all of the interior angles of a triangle?
   A. 90°   B. 180°   C. 270°   D. 360°   E. None of the above

15. What is the **total degrees** in a circle?
   A. 90°   B. 180°   C. 360°   D. 720°   E. None of the above

Use the circle figure (Circle F) for problems 16, 17, and 18.
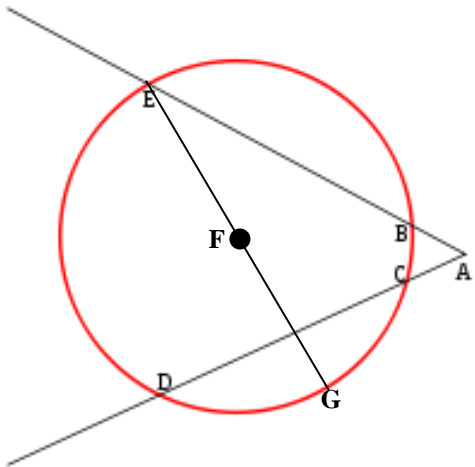

16. Name a **radius** of the following Circle F.
   A. $\overline{AB}$ B. $\overline{DC}$ C. $\overline{EG}$
   D. $\overline{EF}$ E. None of the above

17. In Circle F, EF = 8 in. What would the length EG be?
   A. 8 in.   B. 10 in.   C. 12 in.
   D. 16 in.   E. None of the above

18. Name a point on the exterior of the circle.
   A. A   B. B   C. F   D. D
   E. None of the above

19. Find the circumference of a circle with a radius of 15 cm.   Formula: $C = \pi d$
   A. 47.12 cm   B. 94.25 cm   C. 47.12 sq. cm   D. 94.25 sq. cm
   E. None of the above

20. Find the area of a circle with a radius of 9 m. Formula: $A = \pi r^2$
   A. 56.55 sq. m   B. 56.55 m   C. 254.47 sq. m   D. 254.47 m
   E. None of the above

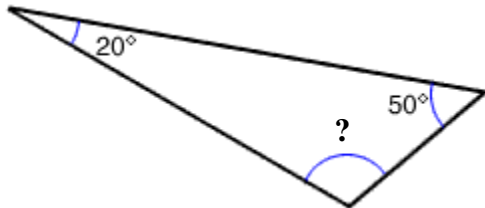21. What is the **volume** of the following rectangular solid?   Formula: V = l x w x h

   A. 140 cu. in.   B. 166 sq. in.   C. 39 sq. in.
   D. 16 cu. in.   E. None of the above

5 in.

7 in.

4 in.

22. Select all shapes **similar** to:
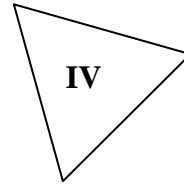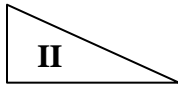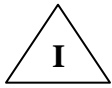
I II III IV V

A. I , II   B. II, III, and IV   C. I, III, IV   D. I, IV

E. None of the above

23. Determine the **missing angle measure** in the triangle:

20°   50°   ?

A. 20°
B. 50°
C. 70°
D. 110°
E. None of the above

24. Determine the **missing angle measure** in the triangle:

?   80°   45°
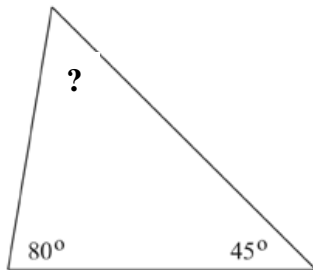
A. 10°
B. 55°
C. 45°
D. 125°
E. None of the above

25. What is the volume of a cube with sides of 3 inches?   *Formula:* V = s³ or V = l x w x h
     A. 12 sq. in.   B. 12 cu. in.   C. 18 cu. in.   D. 27 cu. in.   E. None of the above

26. What is the total volume of the following layered 3-D figures. The blocks are each one cubic cm.
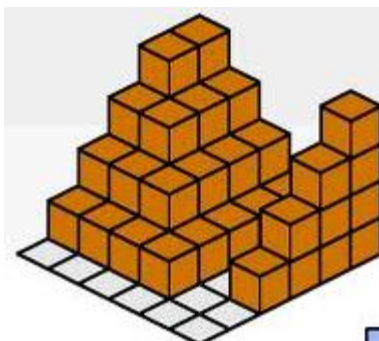
A. 60 cubic cm
B. 50 cubic cm
C. 40 cubic cm
D. 30 cubic cm
E. None of the above

Figure from: http://scratch.mit.edu/

27. Find the **area** of the following figure: *Formula:* A = ½ x (b₁ + b₂) x h

8cm

14cm

20cm

A. 42 sq. cm
B. 174 sq. cm
C. 196 sq. cm
D. 392 sq. cm
E. None of the above

28. What is the **geometric name** of the table shown?

A. Rectangular
B. Pentagonal
C. Hexagonal
D. Trapezoidal
E. None of the above
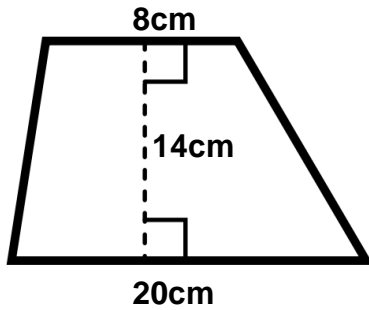
Figure from: http://www.tablelegsonline.com

29. What **figure** will the net fold up to be?
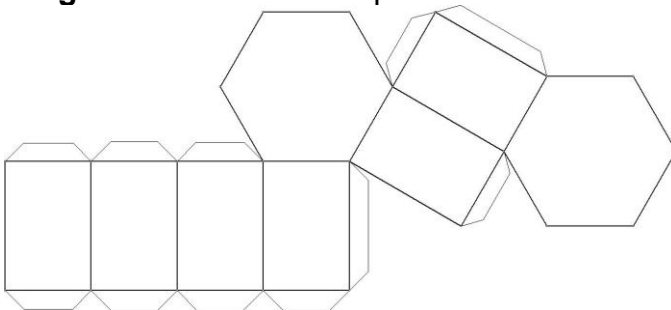
A. Pentagonal Prism
B. Square Prism
C. Hexagonal Prism
D. Hexagonal Pyramid
E. None of the above

Figure from: http://home.planet.nl

30.   What statement is **NOT** always true?
    A. A rectangle is always a square.
    B. A square is always a rhombus.
    C. A rectangle is always a parallelogram.
    D. A square is always a rectangle.
    E. None of the above.

31. How many **lines of symmetry** does this block letter have?

A. 1   B. 2   C. 3
D. 4   E. None of the above

32. When looking at the letters below, what is the **transformation** from the original?

A. translation   B. reflection   C. rotation
D. dilation   E. None of the above

33.   What is the **elapsed time** when you leave at 7:30am on a family trip and drive until 9:00pm?
       A. 1 ½ hr.   B. 10 ½ hr.   C. 8 ½ hr.   D. 13 ½ hr.   E. None of the above

34.   Find the **area** of the composite shape in the grid below.
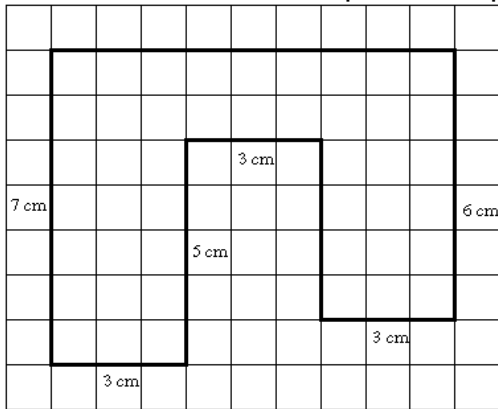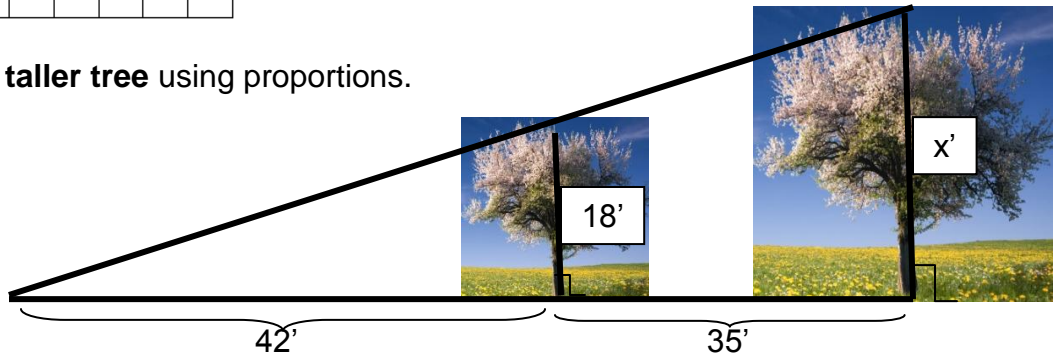

3 cm
7 cm
5 cm
6 cm
3 cm
3 cm

A. 39 sq. cm
B. 45 sq. cm
C. 63 sq. cm
D. 99 sq. cm
E. None of the above

Figure from: http://www.cimt.plymouth.ac.uk

35. Find the height of the **taller tree** using proportions.

A. 15'

B. 25'
C. 33'
D. 52'
E. None of the above

18'
x'
42'
35'

Use the protractor for problems 36-38.
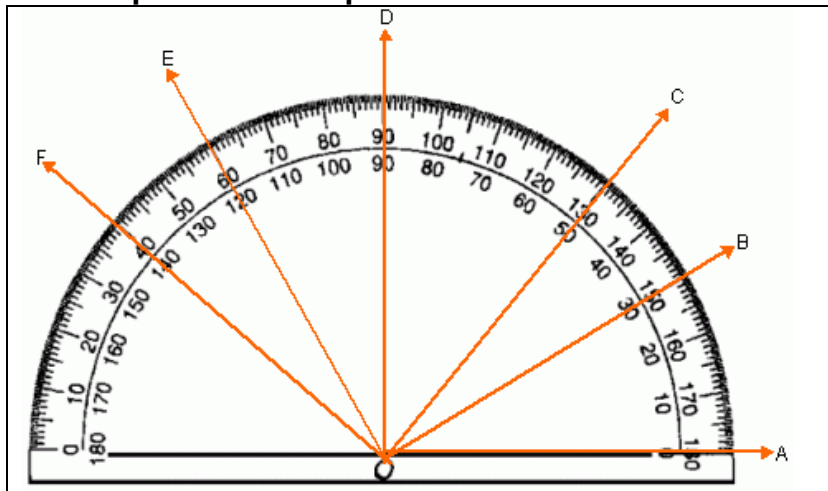
36.   What **type of angle** is ∠AOE ?
       A. Acute   B. Right
       C. Obtuse   D. Straight
       E. None of the above

37. What is the measure of ∠AOC?
       A. 130°   B. 50°   C. 20°
       D. 90°   E. None of the above

38. What is the measure of ∠EOC?
       A. 120°   B. 150°   C. 130°
       D. 70°   E. None of the above

39. If two angles are supplementary and one angle is 37°, what is the measure of its supplement?
       A. 37°   B. 53°   C. 143°   D. 63°   E. None of the above

40. What is a freezing in Celsius?
       A. 0° C   B. 32° C   C. 100° C   D. 212°   E. None of the above

Shade the correct answer!
Example: A   ●   C   D   E

Name_____

School _____

1.	A	B	C	D	E	21.	A	B	C	D	E
2.	A	B	C	D	E	22.	A	B	C	D	E
3.	A	B	C	D	E	23.	A	B	C	D	E
4.	A	B	C	D	E	24.	A	B	C	D	E
5.	A	B	C	D	E	25.	A	B	C	D	E
6.	A	B	C	D	E	26.	A	B	C	D	E
7.	A	B	C	D	E	27.	A	B	C	D	E
8.	A	B	C	D	E	28.	A	B	C	D	E
9.	A	B	C	D	E	29.	A	B	C	D	E
10.	A	B	C	D	E	30.	A	B	C	D	E
11.	A	B	C	D	E	31.	A	B	C	D	E
12.	A	B	C	D	E	32.	A	B	C	D	E
13.	A	B	C	D	E	33.	A	B	C	D	E
14.	A	B	C	D	E	34.	A	B	C	D	E
15.	A	B	C	D	E	35.	A	B	C	D	E
16.	A	B	C	D	E	36.	A	B	C	D	E
17.	A	B	C	D	E	37.	A	B	C	D	E
18.	A	B	C	D	E	38.	A	B	C	D	E
19.	A	B	C	D	E	39.	A	B	C	D	E
20.	A	B	C	D	E	40.	A	B	C	D	E

Shade the correct answer!

Example: A ● C D E

Name_____

School _____

ANSWER KEY

1. A B ● D E
2. A B C ● E
3. A ● C D E
4. A B C ● E
5. A B ● D E
6. A ● C D E
7. A B C ● E
8. A B C ● E
9. ● B C D E
10. A B C ● E
11. A B ● D E
12. A B ● D E
13. A B ● D E
14. A ● C D E
15. A B ● D E
16. A B C ● E
17. A B C ● E
18. ● B C D E
19. A ● C D E
20. A B ● D E

21. ● B C D E
22. A B C ● E
23. A B C ● E
24. A ● C D E
25. A B C ● E
26. A ● C D E
27. A B ● D E
28. A B C ● E
29. A B ● D E
30. ● B C D E
31. ● B C D E
32. A ● C D E
33. A B C ● E
34. A ● C D E
35. A B ● D E
36. A B ● D E
37. A ● C D E
38. A B C ● E
39. A B ● D E
40. ● B C D E