

Kansas City Area Teachers of Mathematics
2011 KCATM Contest

**GEOMETRY AND MEASUREMENT TEST
GRADE 4**

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.

1. What is the geometric name for the entire figure shown in **Figure 1**.



Figure 1

- a) ray AB
- b) line segment AB
- c) line AB
- d) ray BA
- e) not given

Use **Figure 2** for problems #2-5.

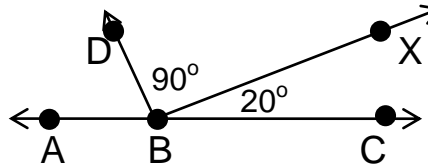


Figure 2

- 2. What type of angle is $\angle DBC$?
 - a) acute
 - b) right
 - c) obtuse
 - d) straight
 - e) not given
- 3. What type of angle is $\angle DBX$?
 - a) acute
 - b) right
 - c) obtuse
 - d) straight
 - e) not given
- 4. What is the measure of $\angle ABD$?
 - a) 60°
 - b) 20°
 - c) 110°
 - d) 70°
 - e) not given
- 5. What is the correct name for the straight angle?
 - a) $\angle ABC$
 - b) $\angle DBX$
 - c) $\angle CBX$
 - d) $\angle CBD$
 - e) not given

Use **Figure 3** for problems 6-7.

6. What type of line segments are \overline{AB} and \overline{BC} in the rectangular solid shown in **Figure 3**?

- a) parallel
- b) obtuse
- c) perpendicular
- d) acute
- e) not given

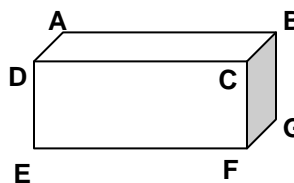


Figure 3

- 7. Name 2 parallel lines in **Figure 3**?
 - a) \overline{AB} and \overline{AD}
 - c) \overline{DE} and \overline{BC}

For questions #8-10, refer to the coordinate plane shown.

8. Which point has the coordinates of (0, 2)?

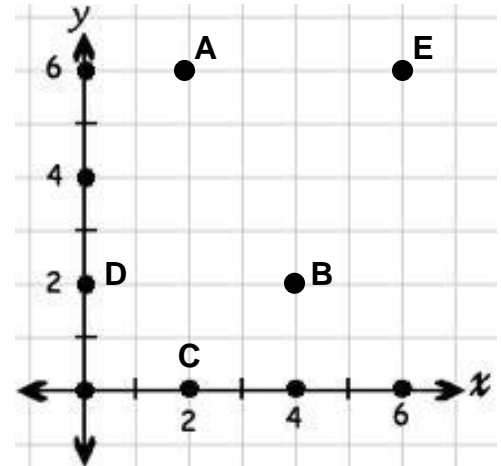
- a) A c) C
- b) B d) D
- e) not given

9. Give the coordinates of point B.

- a) (2, 4) c) (2, 6)
- b) (4, 2) d) (6, 5)
- e) not given

10. Connect points A, D, and E. What is the name of the figure?

- a) parallelogram c) pentagon
- b) line segment d) triangle
- e) not given



For questions #11-13, refer to the circle in **Figure 4**.

11. What is the geometric term describing Point R ?

- a) circle c) center
- b) diameter d) radius
- e) not given

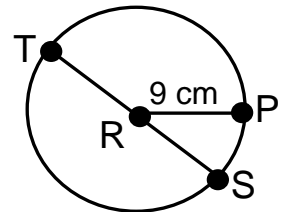


Figure 4

12. What is the geometric term describing \overline{RS} ?

- a) circle c) radius
- b) diameter d) center
- e) not given

13. If $RP = 9$ cm, what is the measure of TS ?

- a) 18 cm c) 4.5 cm
- b) 9 cm d) 27 cm
- e) not given

14. What is the perimeter of the **square** in Figure 5?

- a) 7.4 cm c) 54.76 cm
- b) 29.6 cm d) 14.8 cm
- e) not given

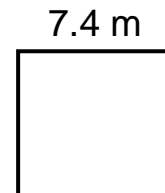
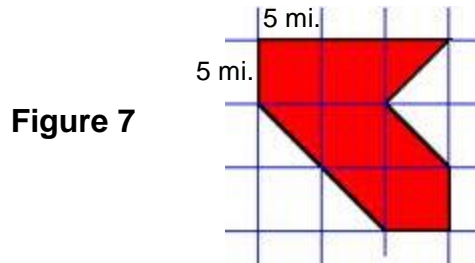


Figure 5

15. Which statement is ALWAYS true?
- a) A rectangle is always a square.
 - b) A square is always a rectangle.
 - c) A rhombus is always a square.
 - d) A quadrilateral is always a rectangle.
 - e) not given
16. How many tons are in 6,000 pounds?
- a) 6
 - b) 2
 - c) 4
 - d) 3
 - e) not given
17. If a basketball player is $6\frac{1}{2}$ feet tall, how tall is the player in inches?
- a) 65 inches
 - b) 75 inches
 - c) 78 inches
 - d) 90 inches
 - e) not given
18. If you drink 8 glasses of water a day and each glass is 8 oz., what part of a gallon do you drink?
- a) pint ($\frac{1}{8}$ gallon)
 - b) half a gallon
 - c) quart ($\frac{1}{4}$ gallon)
 - d) gallon
 - e) not given
19. How many meters would you have if you have 20,000 centimeters?
- a) 200
 - b) 2,000
 - c) 20
 - d) 2
 - e) not given
20. Which of the following is the closest to the length of a millimeter?
- a) length of a pencil
 - b) height of a soup can
 - c) thickness of a dime
 - d) width of a door
 - e) not given
21. Which of the following **is reasonable**?
- a) A cell phone measures 2 in. long, 1 in. wide, and 3 in. thick.
 - b) An average 4th grade student weighs 175 pounds.
 - c) A summer temperature in Kansas and Missouri is 120° F.
 - d) A cross country runner runs more than 1 mile.
 - e) not given
22. Which of the following **is NOT reasonable**?
- a) A full bathtub holds 5 gallons of water.
 - b) You bake cookies at 375° Fahrenheit for 10-12 minutes.
 - c) You walk $\frac{1}{2}$ mile to school.
 - d) The length of your shoe is about 10 inches.
 - e) not given

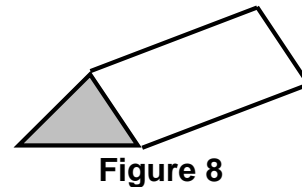
29. If 2 angles in a triangle are 63° and 48° , what is the measure of the third angle?
- a) 69°
 - b) 111°
 - c) 15°
 - d) 25°
 - e) not given

30. Find the **area** of **Figure 7** if the distance between each vertical and horizontal line is 5 miles.

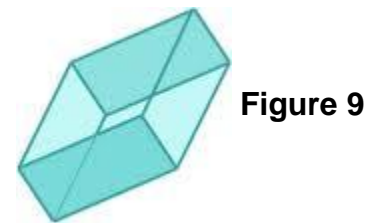


- a) 40 sq. miles
 - b) 150 sq. miles
 - c) 200 sq. miles
 - d) 100 sq. miles
 - e) not given
31. What is the **shape** of **Figure 8**?

- a) triangular pyramid
- b) triangular prism
- c) rectangular prism
- d) cylinder



32. How many **faces** does **Figure 9** have?
- a) 2
 - b) 8
 - c) 6
 - d) 12
 - e) not given



33. If a 90° angle is bisected, what is the measure of the new angle?
- a) 30°
 - b) 60°
 - c) 45°
 - d) 90°
 - e) not given

34. The scale on a map reads: 1 inch = 50 miles. What would be the distance on the map for a 200 mile trip from Kansas City to Omaha?
- a) 4 inches
 - b) 5 inches
 - c) $4\frac{1}{2}$ inches
 - d) $5\frac{1}{2}$ inches
 - e) not given

35. What is the probability of the spinner landing on an odd number in **Figure 10** with all sectors equal in size?

- a) 1/3
- b) 1/4
- c) 1/2
- d) 1/6
- e) not given

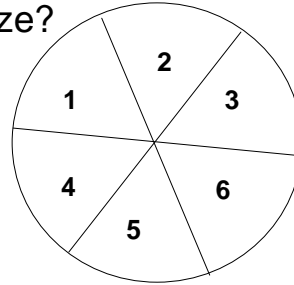


Figure 10

36. What is the **volume** of the three dimensional solid in **Figure 11** if the formula is $V = l \times w \times h$?

- a) 12 cubic units
- b) 36 cubic units
- c) 47 cubic units
- d) 60 cubic units
- e) not given

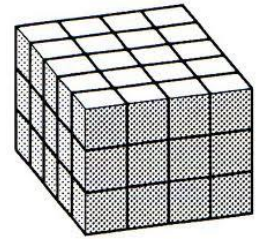


Figure 11

37. Which figure does **NOT** have **rotational symmetry** in **Figure 12**?

- a) a
- b) e
- c) c
- d) f
- e) not given

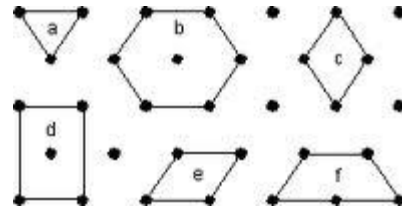


Figure 12

38. What is the 9th triangular number if the first 5 triangular numbers are shown in **Figure 13**?

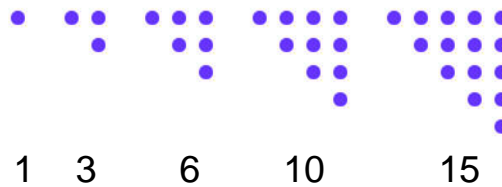
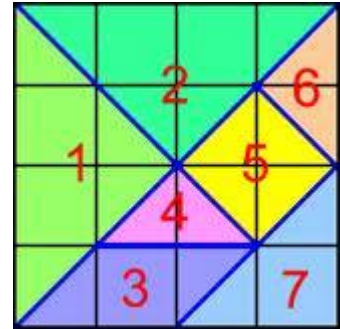


Figure 13

- a) 21
- b) 55
- c) 45
- d) 36
- e) not given

39. Figure 14 shows the 7 tangram shapes. What fractional part of the total area is the triangle in shape #1?

- a) $\frac{1}{5}$ c) $\frac{1}{6}$
b) $\frac{1}{3}$ d) $\frac{1}{4}$
e) not given



40. To the nearest whole number, how many more times does the back tire of a Big Wheel tricycle go around compared to the front tire? The front tire is a 16 inch diameter and the back tire is an 8 inch diameter. The formula is:
circumference = 3.14 x diameter.

- a) The back tire goes around 10 more times than the front tire.
b) The back tire goes around 2 more times than the front tire.
c) The back tire goes around 3 more times than the front tire.
d) The back tire goes around 4 more times than the front tire.
e) not given

