

GEOMETRY INDIVIDUAL TEST – WANDO MATH TOURNAMENT 2010

Note – NOTA (choice E) means none of the answers are correct

- The measure of each interior angle in a regular dodecagon is \_\_\_\_\_ degrees.
 

A. 30                      B. 18                      C. 150                      D. 162                      E. NOTA
- The length of a rectangle is quartered and the width is halved. The area of the rectangle has been multiplied by how much?
 

A.  $1/8$                       B.  $1/4$                       C.  $3/8$                       D.  $7/8$                       E. NOTA
- Points  $A$ ,  $B$ , and  $C$  are collinear. If  $AB = 48$ ,  $BC = 21$ , and  $AC = 27$ , determine which point is between the other two.
 

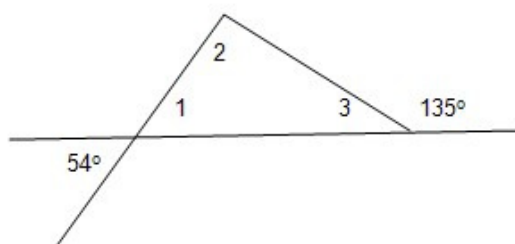
A.  $A$  and  $C$  name the same point      B.  $A$  is between  $B$  and  $C$                       C.  $B$  is between  $A$  and  $C$   
 D.  $C$  is between  $A$  and  $B$                       E. NOTA
- If the radius of a circle is decreased from 6 inches to 3 inches, by what fraction is its area decreased?
 

A.  $1/8$                       B.  $1/4$                       C.  $1/2$                       D.  $3/4$                       E. NOTA
- Mary is riding her bike on a flat, horizontal sidewalk. The path taken by the center of her wheels is best described as:
 

A. circles above the sidewalk  
 B. a line parallel to the sidewalk  
 C. a sine curve above the sidewalk  
 D. the graph of an ellipse above the sidewalk  
 E. NOTA
- In a regular hexagon, opposite sides are 12 cm apart. What is the length of each side?
 

A.  $4\sqrt{3}$                       B.  $2\sqrt{3}$                       C. 6                      D.  $6\sqrt{3}$                       E. NOTA

7. Find the measure of  $\angle 2$ :



- A.  $45^\circ$                       B.  $99^\circ$                       C.  $81^\circ$   
 D.  $101^\circ$                       E. NOTA

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8. Which statement is logically equivalent to the statement:

“If blips are blaps, then dops are dops.”

- A. “If dops are dops, then blips are blaps.”
- B. “If blips are not blaps, then dops are not dops.”
- C. “If dops are not dops then blips are blaps.”
- D. “If dops are not dops, then blips are not blaps.”
- E. NOTA

9. If the graphs of  $5y - 3x - 10 = 0$  and  $3y + kx + 12 = 0$  are to meet at right angles, then the value of  $k =$

- A. -5
- B. 5
- C.  $\frac{5}{3}$
- D.  $-\frac{5}{3}$
- E. NOTA

10. Two vertical posts are 40 feet apart. If the distance between the tops of the posts is 41 feet and the shorter post is 49 feet, how tall is the larger post?

- A. 50 feet
- B. 58 feet
- C. 80 feet
- D. 98 feet
- E. NOTA

11. Find the perimeter for a rhombus with diagonals 30 inches and 40 inches.

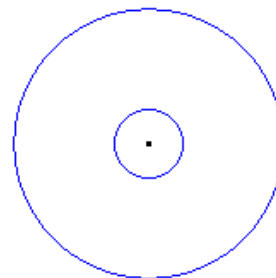
- A. 140 inches
- B. 200 inches
- C. 100 inches
- D. 120 inches
- E. NOTA

12. A square has twice the perimeter of a circle. The ratio of the area of the square to the area of the circle is:

- A. 4/1
- B.  $\pi/1$
- C.  $1/\pi$
- D.  $16/\pi$
- E. NOTA

13. Two concentric circles form the given annulus (mathematical word for ring – see figure). If the area of the annulus (or the area between the two circles) is  $825\pi$  and the diameter of the smaller circle is 8, find the diameter of the larger circle.

- A. 54
- B. 56
- C. 58
- D. 60
- E. NOTA



14. If a rectangle has a perimeter of 200 meters, what is the largest area it can have in square meters?

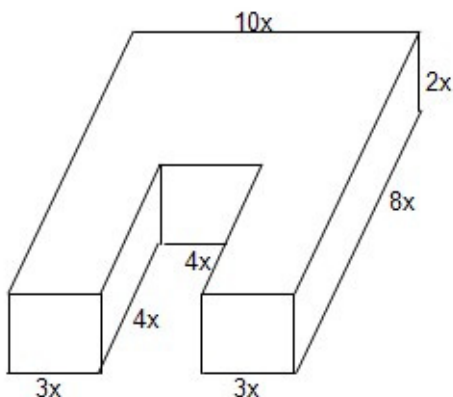
- A. 2400
- B. 2300
- C. 2200
- D. 2100
- E. NOTA

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15.  $f(x) = 4x + 9$ . A perpendicular line is drawn through  $f(x)$  and  $(3, 9)$ . What is the x-coordinate of the point where  $f(x)$  and the perpendicular line intersect?

- A.  $\frac{3}{17}$       B.  $\frac{3}{34}$       C.  $\frac{3}{51}$       D.  $\frac{3}{68}$       E. NOTA

16. Find the surface area of the following:



- A.  $256x^2$       B.  $192x^2$       C.  $216x^2$       D.  $154x^2$       E. NOTA

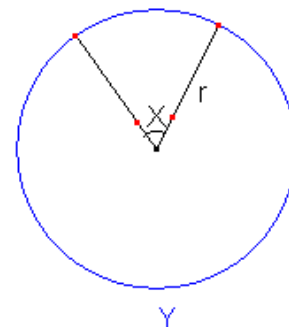
17. Which of the following are true? (A kite is defined as a quadrilateral with exactly two pairs of congruent consecutive sides)

- I) All squares are rectangles      II) All rectangles are kites  
 III) All kites can be divided into two isosceles triangles  
 IV) A rhombus can be a kite only if it is a square

- A. I, III and IV      B. I, II      C. I, II, and III      D. I, II, III, and IV      E. NOTA

18. Given the following sector with a radius of  $r$  and a central angle of  $X$  degrees

(see figure). The area of the sector is  $\frac{25\pi}{12}$  and the ratio of the arc length of the sector to the arc length of arc Y is 1:11. Find the perimeter of the sector.



- A.  $\frac{5\pi}{6}$       B. 10      C.  $10 + \frac{5\pi}{6}$       D.  $\frac{25\pi}{12}$       E. NOTA

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19. Find the distance between the point  $(4, -7)$  and the line  $2x - 3y = 5$ .

- A.  $\frac{24\sqrt{65}}{65}$       B.  $\frac{34\sqrt{13}}{13}$       C.  $\frac{24\sqrt{13}}{13}$       D.  $\frac{34\sqrt{65}}{65}$       E. NOTA

20. In a circle with radius 10 inches, a chord is 4 inches from the center. What is the length of the chord?

- A.  $2\sqrt{29}$       B.  $2\sqrt{21}$       C.  $4\sqrt{29}$       D.  $4\sqrt{21}$       E. NOTA

21. In triangle ABC,  $BC = AC$ ,  $\angle B = 6x + 7$  and  $\angle C = 4x + 6$ . Find the measure of  $\angle A$  in degrees.

- A. 52      B. 60      C. 64      D. 67      E. NOTA

22. Two supplementary angles have measures  $x^2 - 7x$  and  $x^2 + 3x + 150$ . Find the complement of the smaller angle.

- A. 30      B. 60      C. 90      D. no solution      E. NOTA

23. Two sides of a triangle have lengths 4 and 7. Which of the following is a possible length of the third side?

- A. 3      B. 8      C. 11      D. 12      E. NOTA

24. Luke is standing on top of a 100 foot tall building. He looks down and sees Han at an angle of depression of 60 degrees. How far is Han from the base of the building, assuming that Luke's height is ignored and that the building and the ground form a right angle?

- A. 100      B. 200      C.  $\frac{100\sqrt{3}}{3}$       D.  $\frac{200\sqrt{3}}{3}$       E. NOTA

25. Find the number of degrees in the acute angle formed between the minute and the hour hand of the clock when it reads 11:08.

- A. 68      B. 70      C. 72      D. 74      E. NOTA

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Answers

1. C
2. A
3. D
4. B (D is also acceptable)
5. B
6. A
7. C
8. D
9. B
10. B
11. C
12. B
13. C
14. E (2500)
15. A
16. C
17. E (II and IV are false)
18. C
19. C
20. D
21. D
22. B
23. B
24. C
25. D