

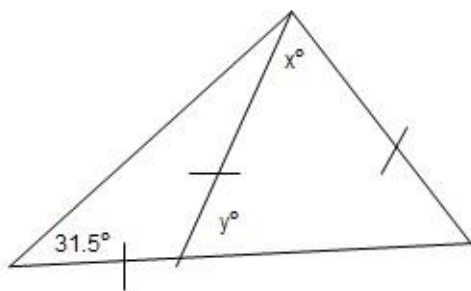
GEOMETRY INDIVIDUAL TEST—WANDO MATH TOURNAMENT

Note—NOTA (choice E) means “None of these answers” is correct

1) Which statement below is true?

- A) If two lines do not intersect, that means that they are parallel.
- B) Side-Side-Angle is a congruence relation for triangles.
- C) The converse of “if  $\sim p$  then  $q$ ” is “if  $\sim q$  then  $p$ ”
- D) A square is a rhombus.
- E) NOTA

2) In the triangle below, find the ratio of  $x:y$ .



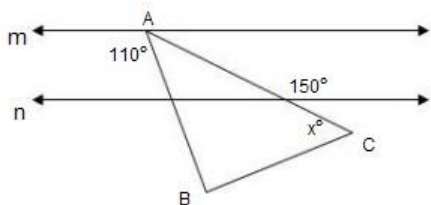
- A) 7:6
- B) 6:7
- C) 7:26
- D) 26:7
- E) NOTA

3) Find the value of  $x$  if the length of  $\overline{HK} = x + y$ , the length of  $\overline{KL} = 5$ ,  $\overline{GH} = 3y$ ,  $\overline{GL} = 18$ , and the length of  $\overline{HL} = 12$ .



- A) 1
- B) 2
- C) 3
- D) 5
- E) NOTA

4) Given that  $m \parallel n$  and  $\angle ABC$  is a right angle. Use the angles in the figure below to find the value of  $x$ .



- A) 45
- B) 50
- C) 55
- D) 60
- E) NOTA

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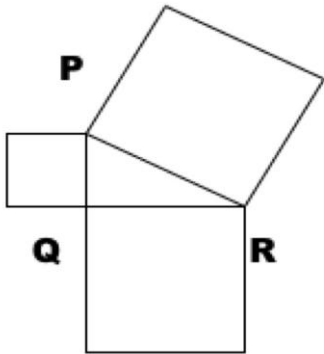
- 5) Grandma baked a cake for her 4 grandchildren when they were visiting for a weekend. After she took the cake out of the oven to cool, she went outside to work in her flower garden. When she returned to the kitchen, she discovered that half of the cake had been eaten by one of the children. When Grandma questions the children, they tell her the following:

Chandler: Katie ate the cake.  
Debbie: I did not eat the piece of cake.  
Katie: Thomas ate the cake.  
Thomas: Katie lied when she said I ate the cake.

If only one of these four statements is true, and only one of the four children committed this crime, who ate the cake?

- A) Katie      B) Debbie      C) Chandler      D) Thomas      E) NOTA
- 6) Mike is in a field. If he walks 11 yards east, 30 yards south, 4 yards east, and 22 yards north, how many yards is he from his starting point?
- A) 17      B) 23      C) 25      D) 67      E) NOTA

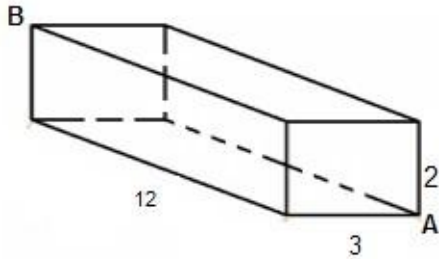
- 7) Angle PQR is a right angle. The three quadrilaterals shown are squares. The sum of the areas of the three squares is 450 square inches. What is the number of square inches of the area of the largest square?



- A) 15      B) 144      C) 150      D) 225      E) NOTA
- 8) The ratio of 4 angles in a quadrilateral is 1:2:2:4. Find the positive difference between the largest and the smallest angle.
- A) 40°      B) 80°      C) 120°      D) 160°      E) NOTA

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- 9) A bug wishes to crawl from point A to point B on the surface of a wooden box with dimensions  $2 \times 3 \times 12$  units as shown. Find the shortest possible distance of the walk.



- A) 13      B)  $2 + 3\sqrt{17}$       C) 17      D)  $3 + 2\sqrt{37}$       E) NOTA

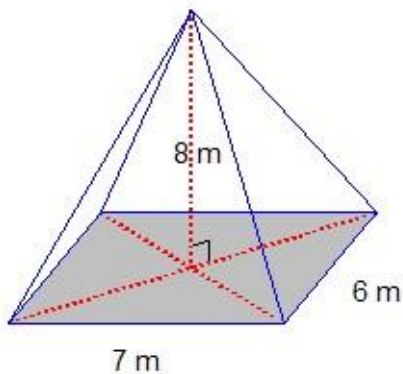
- 10) What is the geometric mean of 3 and 27?

- A) 9      B) 10      C) 15      D) 21      E) NOTA

- 11) If the sides of a regular octagon have length  $x$  units, what is the area of the octagon in units squared?

- A)  $8x$       B)  $2x^2(\sqrt{2} + 1)$       C)  $8x^2$       D)  $2x^2(\sqrt{3} + 1)$       E) NOTA

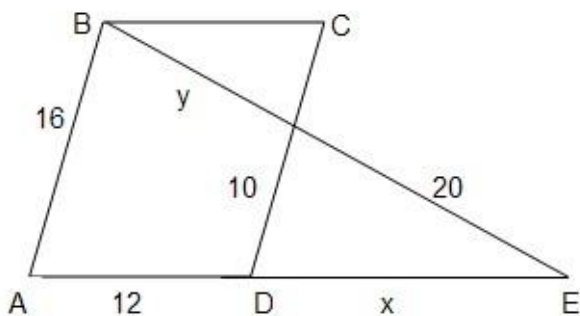
- 12) Find the volume of the rectangular pyramid shown below with a perpendicular height of 8 meters, and lengths of 6 and 7 meters.



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- A)  $112 \text{ m}^3$     B)  $168 \text{ m}^3$     C)  $336 \text{ m}^3$     D)  $448 \text{ m}^3$     E) NOTA

13) In the figure below, ABCD is a parallelogram. Find the sum of the values of x and y.

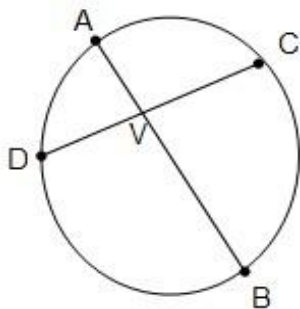


- A) 40    B) 36    C) 24    D) 32    E) NOTA

14) A hot air balloon rises at the rate of 30 feet per minute. An observer is lying on his back 400 feet away, looking at the sky and enjoying the day. What is the angle of elevation (to the nearest degree) from the observer to the hot air balloon after half an hour?

- A)  $1^\circ$     B)  $33^\circ$     C)  $66^\circ$     D)  $89^\circ$     E) NOTA

15) Given that two chords of a circle, AB and CD, intersect at point V. If  $m\widehat{AC} = 30$  and  $m\widehat{DB} = 100$  find  $m\angle AVC$ .



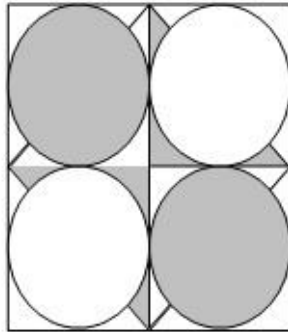
- A)  $70^\circ$     B)  $35^\circ$     C)  $65^\circ$     D)  $130^\circ$     E) NOTA

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16) Which of the following cannot be the sides of a 30-60-90 triangle?

- A)  $10, 10\sqrt{3}, 20$       B)  $\frac{\sqrt{3}}{2}, \frac{3}{2}, \sqrt{3}$       C)  $\sqrt{2}, \sqrt{6}, 2\sqrt{2}$   
 D)  $\sqrt{3}, \sqrt{13}, 4$       E) NOTA

17) In the target below, the radius of each circle is 1 unit. If a dart is randomly thrown at the target, what is the probability (to 3 significant digits) that it lands in a shaded section? (The picture below contains 4 circles inside a square.)



- A) 0.423      B) 0.446      C) 0.569      D) 0.643      E) NOTA

18) If an angle is four times the measure of its complement, what is the angle?

- A)  $18^\circ$       B)  $22.5^\circ$       C)  $72^\circ$       D)  $90^\circ$       E) NOTA

19) Find the area of a triangle that has side lengths 5 cm, 6 cm, and 10 cm.

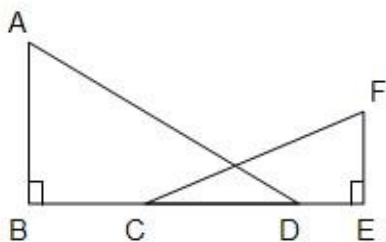
- A)  $16 \text{ cm}^2$       B)  $\sqrt{264} \text{ cm}^2$       C)  $17 \text{ cm}^2$       D)  $\sqrt{294} \text{ cm}^2$       E) NOTA

20) An isosceles triangle has a perimeter of 42 inches. If one of the legs is 15 inches, what is the length of the altitude from the vertex to the base?

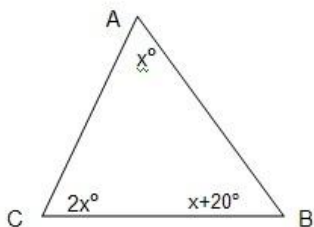
- A) 9 in.      B)  $\sqrt{189}$  in.      C)  $\sqrt{261}$  in.      D)  $\sqrt{306}$  in.      E) NOTA

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- 21) Given that  $AB=10$ ,  $FE=4$ ,  $BD= x+1$ ,  $CE= x-2$ , and angle A is congruent to angle C. Find the length of CE.



- A) 2            B) 3            C) 4            D) 5            E) NOTA
- 22) "Lines that do not intersect are parallel."  
When is the above statement true?
- A) Sometimes            B) Always            C) Never
- 23) ABCD is a parallelogram in the first quadrant with point A at the origin, point B at  $(b,0)$ , and point C at  $(b+c, a)$ . What is are the coordinates for point D?
- A)  $(0, a)$             B)  $(b, a)$             C)  $(c, a)$             D)  $(b-c, a)$             E) NOTA
- 24) Given triangle ABC below, give the lengths of the sides from greatest to smallest.



- A) AB, BC, CA            B) AB, CA, BC            C) BC, CA, AB
- D) BC, AB, CA            E) NOTA
- 25) Select the equation for a circle with a radius of 4 centered at  $(2,1)$ .
- A)  $(x-2)^2 + (y-1)^2 = 4$             B)  $(x+2)^2 + (y+1)^2 = 4$
- C)  $(x-2)^2 + (y-1)^2 = 2$             D)  $(x+2)^2 + (y+1)^2 = 2$             E) NOTA