** Let NOTA be defined as "None Of The Above answers is correct".
** Diagrams may not be drawn to scale. **

1. 'CPCTC' is an abbreviation for an important geometric congruency theorem. What does the "P" stand for?

A) pairs B) parallel C) parts D) proportion E) NOTA

2. Find the area of the isosceles trapezoid with bases measuring 12 in. and 20 in., and legs each measuring 5 in.

A) 96 sq. in. B) 128 sq. in. C) 64 sq. in. D) 80 sq. in. E) NOTA

3. The tires on Josh's bicycle have a radius of 1 foot. When he rides his bicycle from his house to school, the wheels rotate exactly 200 times. How far (in feet) does Josh live from school?

A) 200 B) 200π C) 400π D) 400 E) NOTA

4. An exterior angle of a regular polygon measures $36°$. How many sides does the polygon have?

A) 10 B) 8 C) 12 D) 20 E) NOTA

5. Find the length of the longest leg of a 30-60-90 triangle with a hypotenuse of length 28.

A) 14 B) 20 C) $14\sqrt{2}$ D) $14\sqrt{3}$ E) NOTA

6. For a circle with a diameter of 8 meters, find the area (in square meters) of a sector of the circle with an arc length of $60°$.

A) $\frac{8\pi}{30}$ B) $\frac{32\pi}{3}$ C) $\frac{4\pi}{3}$ D) $\frac{8\pi}{3}$ E) NOTA

7. In triangle ABC, $m\angle A = m\angle B$. If $AC = 3x - 6$, $AB = 2x - 1$, and the perimeter of the triangle is 43, find the length of $\overline{BC}$.

A) 7 B) 15 C) 13 D) $14\frac{1}{3}$ E) NOTA

8. The supplement of an angle is six times that of its complement. Find the complement of the angle.

A) 72 B) 18 C) 36 D) 108 E) NOTA

9. If an acute angle has a measure of $\left(54+\frac{3x}{2}\right)^\circ$, then which of the following can be concluded?

A) $-96 < x < 24$ B) $x < 24$ C) $-36 < x < 24$ D) $-54 < x < 36$ E) NOTA

10. Which statement is always true?

A) A rhombus is a square.
B) A square is a parallelogram.
C) A parallelogram is a rectangle.
D) A rectangle is a square.
E) NOTA

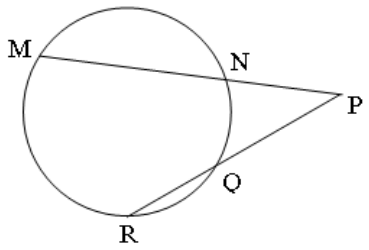
11. In triangle ABC, $m\angle A = m\angle B - 10^\circ$ and $m\angle B = m\angle C - 13^\circ$.
Find the sum of the measures of angles A and C.

A) 49 B) 59 C) 72 D) 121 E) NOTA

12. What is the area (in cm^2) of a circle that contains an 8 cm chord that is 3 cm from the center of the circle?

A) 9π B) 25π C) 16π D) 20π E) NOTA

13. In the figure to the right, PM = 24, MN = 16, and PR = 16. Find RQ.



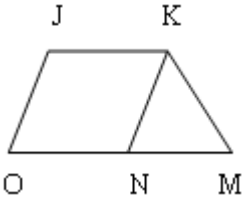
A) 4
B) 8
C) 10
D) 12
E) NOTA

14. Which of the following represents the contrapositive of "If I am good at math, then I will be successful in life."?

A) If I am not good at math, then I will not be successful in life.
B) If I will not be successful in life, then I am not good at math.
C) If I will be successful in life, then I am good at math.
D) If I am good at math, then I will not be successful in life.
E) NOTA

15. How many faces, edges and vertices does an octahedron have (in that order)?
A) 8,12,6 B) 8,8,8 C) 6,12,8 D) 8,8,12 E) NOTA

16. In the diagram, $\overrightarrow{JK} \| \overrightarrow{OM}$, $\overline{JO} \cong \overline{KM}$, $\overrightarrow{JO} \| \overrightarrow{KN}$, $MN = 6$, $JO = 3x + 4$, $KN = 2x + 7$.
Find the perimeter of ΔKMN.



A) 24 B) 26 C) 32 D) 39 E) NOTA

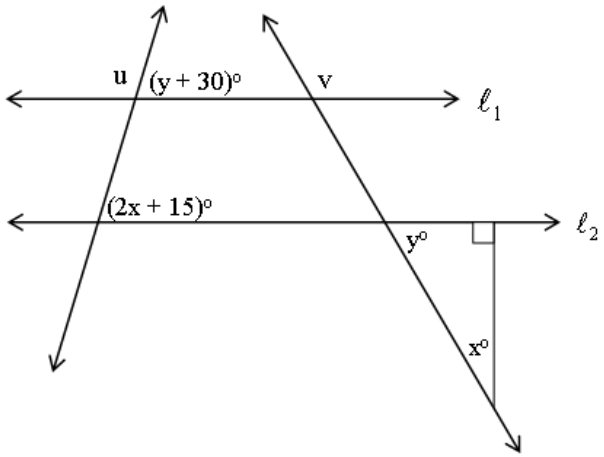
17. At Mavvy's Pizzeria a small pizza has a 10 inch diameter and costs $7. A medium pizza has a 12 inch diameter and costs $11. A large pizza has a 14 inch diameter and costs $17 dollars. Which size gives you the most pizza per dollar?

A) Small
B) medium
C)large
D) all three sizes give you the same amount of pizza per dollar
E) NOTA

18. A triangle is inscribed in circle O. Where is O, in relationship to the triangle?

A) Where the altitudes of the triangle intersect
B) Where the medians of the triangle intersect
C) Where the angle bisectors of the triangle intersect
D) Where the perpendicular bisectors of the triangle intersect
E) NOTA

19. In the figure to the right, $\ell_1 \| \ell_2$. Find u + v.



A) 200
B) 220
C) 240
D) 260
E) NOTA

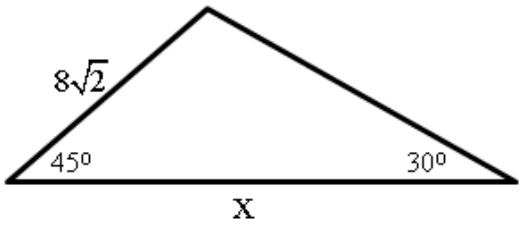
20. Yesterday afternoon Jacob was standing outside and noticed that his shadow was exactly 2 feet longer than his height. At the exact same time, the tree he was standing next to was casting a shadow of exactly 22 feet. If Jacob is 6 feet tall, how tall is the tree?

A) 16 feet, 4 inches B) 16 feet, 5 inches C) 16 feet 6 inches D) 20 feet E) NOTA

21. Find the length of the apothem of a regular hexagon with sides of length 10.

A) $10\sqrt{3}$ B) 5 C) $\frac{10}{\sqrt{3}}$ D) $5\sqrt{3}$ E) NOTA

22. Find x.



A) $8+8\sqrt{2}$ B) $8+8\sqrt{3}$ C) 16 D) 24 E) NOTA

23. A dog is tied to the outside corner of a 20-foot by 20-foot building by a 30-foot leash. What is the area of the piece of land that the dog can explore?

A) 725π B) 775π C) 900π D) 675π E) NOTA

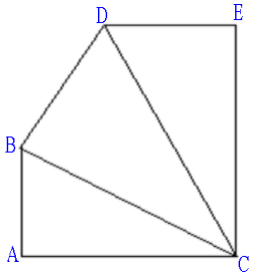
24. How much does the surface area of a spherical orange increase by when it is cut into two equal halves?

A) 0% B) 25% C) 50% D) 100% E) NOTA

25. The sum of the lengths of the diagonals of a rhombus is 40 cm. One diagonal is 8 cm longer than the other. Find the area of the rhombus, in cm^2.

A) 192 B) 180 C) 360 D) 384 E) NOTA

26. In the diagram below, angles BAC, DBC, DEC, and ACE are all right angles. $\Delta BDC \cong \Delta EDC$, $AC = 3\sqrt{3}$, and $AB = 3$. What is the length of EC ?



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

27. What is the measure of the smaller angle made by the hour and minute hands of a clock at 3:37?

A) 90° B) 102° C) 113.5° D) 120° E) NOTA

28. Find the area (in square feet) of an equilateral triangle if the length of its mid-segment is 2 feet.

A) $4\sqrt{3}$ B) $4\sqrt{2}$ C) $2\sqrt{3}$ D) $8\sqrt{3}$ E) NOTA

29. What is the geometric mean of 12 and 48?

A) 24 B) 26 C) 28 D) 30 E) NOTA

30. What is the area, in square units, of a regular hexagon that is inscribed in a circle with a circumference of 16π?

A) $8\sqrt{3}$ B) $16\sqrt{3}$ C) $64\sqrt{3}$ D) $96\sqrt{3}$ E) NOTA