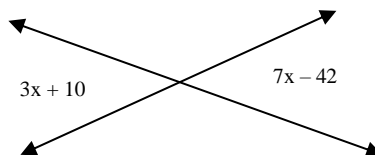
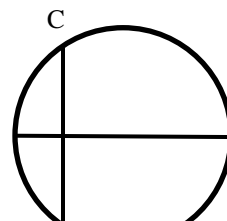


- The diameter of a circle is $8\sqrt{2}$. Calculate the area of the circle in terms of π .
A. 16π B. 32π C. 64π D. $8\pi\sqrt{2}$ E. None of these
- Given a right triangle ABC with a right angle at C inscribed in a circle with radius 5. If $AC = 6$, find the area of the triangle.
A. 8 B. 48 C. 12 D. 24 E. None of these
- Which of the following is a measure of an angle in the diagram?
A. 13 B. 49 C. 52
D. 120 E. None of these
- If B $(-5, 14)$ is the midpoint of \overline{AC} , and A has coordinates $(-29, -42)$ then what are the coordinates of point C?
A. $(-17, 70)$ B. $(-17, -98)$ C. $(19, -98)$ D. $(19, 70)$ E. None of these
- If the angles of a quadrilateral are in a ratio of 1:3:5:6, what is the sum of the two largest angles?
A. 36 B. 132 C. 144 D. 252 E. None of these
- In a triangle, the height is $\frac{3}{2}$ times the length of the base. The area of the triangle is 243 square units. What is the height of the triangle?
A. 18 B. 27 C. 162 D. $9\sqrt{2}$ E. None of these
- In triangle ABC, \overline{BD} bisects $\angle ABC$. If $AB = 5$, $BC = 12$, and $AD = 7$. Find DC .
A. 6 B. $60/7$ C. $84/5$ D. 12 E. 16
- The sum of the interior angles of a regular polygon is 14 times the sum of the exterior angles (one at each vertex). How many sides does the polygon have?
A. 27 B. 30 C. 77 D. 90 E. None of these
- A right circular cone has a height equal to its base diameter. If the volume of the cone is $36\pi\sqrt{2}$, then what is the area of the base?
A. 6π B. 9π C. 18π D. 27π E. None of these
- Find the area of rhombus NERD if the measure of angle N is 60° , and $ED = 10$.
A. $50\sqrt{3}$ B. $25\sqrt{3}$ C. $50\sqrt{2}$ D. $100\sqrt{2}$ E. $100\sqrt{3}$

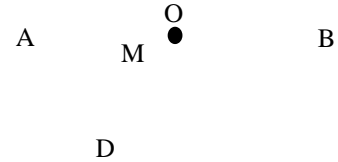


- In circle O, $AB = 16$, $\overline{AO} \perp \overline{CD}$, M is the midpoint of \overline{AO} .



Find the length of chord \overline{CD} .

- A. $4\sqrt{3}$ B. $8\sqrt{3}$ C. $8\sqrt{2}$
 D. $16\sqrt{2}$ E. $16\sqrt{3}$

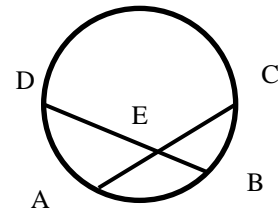


12. Line m is the perpendicular bisector of the line segment with endpoints $(-1, -1)$ and $(9, 1)$. Line n contains the point $(-1, 3)$ and is parallel to the line $x - 2y = -12$. Find the coordinates of the point of intersection of m and n .

- A. $(4, 0)$ B. $(\frac{3}{7}, \frac{17}{2})$ C. $(0, 4)$ D. $(5, 3)$ E. $(3, 5)$

13. Two chords, \overline{AC} and \overline{BD} intersect at point E. Given $DE:EB=2:1$, $AE = 16$, $DB = 60$, and $CE = 3x - 4$. Find the value of x .

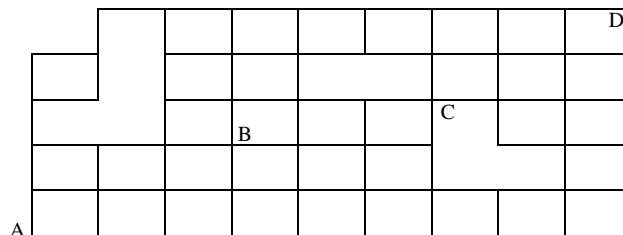
- A. 8 B. 4 C. 12
 D. 16 E. 18



14. The measures of the interior angles of a polygon form an arithmetic progression with the largest being 167° and the smallest being 113° . Find the sum of the 2 largest interior angles.

- A. $\frac{1309}{4}^\circ$ B. $\frac{1307}{4}^\circ$ C. $\frac{1305}{4}^\circ$ D. $\frac{1303}{4}^\circ$ E. None of these

15. How many paths are there from A to D passing through C but not through B? (Paths may only go up and to the right.)



- A. 45 B. 54 C. 120 D. 200 E. None of these

16. A circle has a diameter of 4 inches. A regular polygon with an interior angle of 120° is circumscribed by the circle. What is the area outside the polygon but inside the circle?

- A. $4\pi - 6\sqrt{3}$ B. $16\pi - 3\sqrt{3}$ C. $16\pi - 6\sqrt{3}$ D. $4\pi - 3\sqrt{3}$ E. None of these

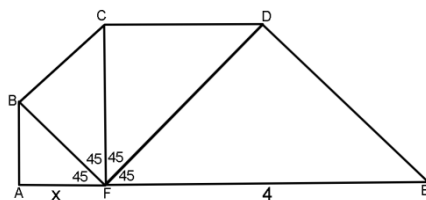
17. A right circular cone of altitude 8 is inscribed in a sphere of radius 5. What is the volume outside the cone but inside the sphere.

- A. $\frac{500\pi}{3}$ B. $\frac{128\pi}{3}$ C. $\frac{256\pi}{3}$ D. 124π E. 372π

18. Find the measure of the smaller angle between the minute and hour hands of a clock 10:30?

- A. 105° B. 120° C. 135° D. 150° E. 165°

19. Find the value of x in the diagram. Assume $\angle A$, $\angle FBC$, $\angle FCD$, and $\angle FDE$ are right angles and $m\angle AFB = m\angle BFC = m\angle CFD = m\angle DFE = 45^\circ$.



- A. $\frac{\sqrt{2}}{2}$ B. 1 C. $\sqrt{2}$ D. 2 E. None of these

20. Two circles have radii 18 and 24. If their centers are 50 units apart, what is the length of their common external tangent?

- A. 24 B. 42 C. $24\sqrt{6}$ D. $8\sqrt{77}$ E. $4\sqrt{154}$

21. A circle has equation $x^2 + y^2 - 4\sqrt{3}x + 2y - 3 = 0$. Find the larger of the two areas into which the y -axis divides the circle.

- A. $\frac{8\pi}{3} - 4\sqrt{3}$ B. $\frac{16\pi}{3} - 8\sqrt{3}$ C. D. E. None of these

22. Three small solid spheres are melted down and recast to form another sphere. The radii of the three small spheres are 3, 4, and 5. What is the radius of the new sphere?

- A. 6 B. $6\sqrt{2}$ C. 7 D. $7\sqrt{2}$ E. 8

23. Find the volume of a right pyramid whose base is an equilateral triangle with side length 12, and whose other edges have length $2\sqrt{15}$.

- A. 48 B. $48\sqrt{3}$ C. 60 D. 72 E. None of these

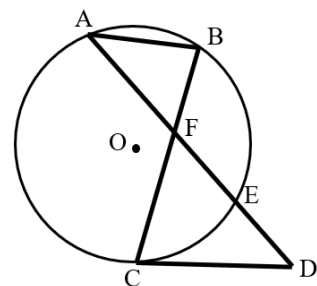
24. \overline{CD} is a diameter of a semi-circle with center O. Point A lies on the extension of \overline{DC} past C. Point E lies on the semi-circle and B is the point of intersection of \overline{AE} with the semi-circle. If $AB = OD$ and $\angle EOD = 45^\circ$, find the measurement of $\angle BAO$.

- A. 10° B. 15° C. 20° D. 25° E. 30°

25. If the center of a circle is (h, k) , find the value of $h + k$ given that $(1, 3)$, $(3, -2)$, and $(2, 0)$ are three points on the circle.

- A. B. C. D. E.

TB1: In the diagram, \overline{CD} is tangent to circle O.
 Arc AC is congruent to arc BC, $AB = 3$, $AF = 6$,
 And $FE = 10$. Find ED.



TB2: What is the sum of the lengths of the diagonals of a regular hexagon with area $54\sqrt{3}$?

TB3: How many triangles of any size are shown in this figure?

