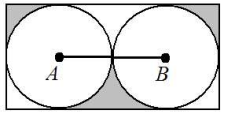
Buyer: (aoxiangnju@126.com)
Transaction ID: 4TT09993UG906311H

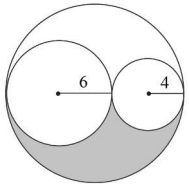
PROBLEMS

Problem 1. An 36-foot by 72-foot floor is tiled with rectangular tiles of size 9 foot by 18 foot. Each tile has a pattern containing two congruent circles and is shaded as shown. How many square feet of the floor are shaded?



(A) $1296-324\pi$ (B) $648-162\pi$ (C) $648-324\pi$ (D) $81-\frac{81}{4}\pi$ (E) $648-\frac{81}{4}\pi$

Problem 2. Circles of radius 4 and 6 are externally tangent and are circumscribed by a third circle, as shown in the figure. What is the ratio of the area of the shaded region to the area of the unshaded regions?

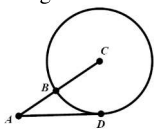


(A) 3/19 (B) 6/19 (C) 7/19 (D) 8/17 (E) 5/7

Problem 3. A sector of 25° on circle A has the same area as a sector of 100° on circle B. What is the ratio of the length of the circumference on circle A to the length of the circumference on circle B?

(A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{4}{1}$ (D) $\frac{3}{1}$ (E) $\frac{2}{1}$

Problem 4. In the diagram, C is the center of the circle and AD is tangent to the circle at D. The line segment AC intersects the circle at B. If $AD = 10$ and $AB = 7$, find the area of the circle.



(A) $\frac{2601}{196}\pi$ (B) $\frac{51}{7}$ (C) $\frac{51}{14}$ (D) $\frac{2016}{196}\pi$ (E) $\frac{51}{14}\pi$

Problem 5. A goat is tied to one of the corners of a rectangular barn on a rope that is 50 feet long. The dimensions of the barn are 40 feet by 30 feet. Assuming

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that the goat can graze wherever its rope allows it to reach, what is the number of square feet of the grazing area for the goat?

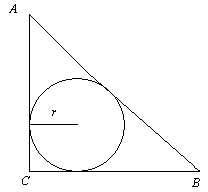
(A) 1875π (B) 125π (C) 1975π (D) 2000π (E) 2016π

Problem 6. Charles walks completely around the boundary of a square. From any point on his path he can see exactly 2 km horizontally in all directions. The area of the region consisting of all points Charles can see is $144 + 4\pi$ during his walk. What is the length of the side of the square?

(A) 4 (B) 6 (C) 8 (D) 10 (E) 12

Problem 7. In triangle ABC, $\angle C = 90°$. $AC = 6$, $BC = 8$. Find the area of the regions outside the circle but inside the triangle.

(A) $12\sqrt{2}$ (B) $24 - 4\pi$ (C) 24 (D) $24 - 2\pi$ (E) 14



Problem 8. Triangle ABC is an equilateral triangle and O is the center of its inscribed circle. If the area of the circle is 4π cm^2, what is the area, in square centimeters, of triangle ABC?

(A) $12\sqrt{2}$ (B) $12\sqrt{3}$ (C) 24 (D) 12π (E) 14

Problem 9. An isosceles triangle with equal sides of 5 inches and a base of 6 inches is inscribed in a circle. What is the area, in square inches, of the circle?

(A) $\frac{25}{8}$ (B) 10π (C) $\frac{625}{64}\pi$ (D) 9π (E) $\frac{225}{4}\pi$

Problem 10. Equilateral ΔABC is inscribed in circle O. The radius of circle O is 12 inches. How many square inches are in the area of ΔABC?

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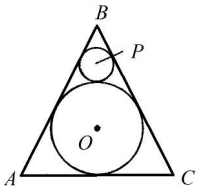
(A) $108\sqrt{3}$ (B) $54\sqrt{3}$ (C) $36\sqrt{3}$ (D) $27\sqrt{3}$ (E) 187

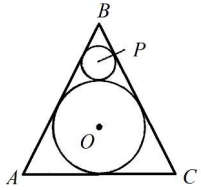
Problem 11 Circle O is inscribed in equilateral triangle ABC. Circle P of radius 1 is tangent to circle O and segments AB and BC. Find the area of triangle ABC.

(A) 27 (B) $9\sqrt{3}$ (C) $36\sqrt{3}$ (D) $27\sqrt{3}$ (E) 47



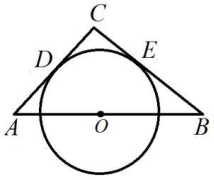
Problem 12. Circle O of radius 45 is inscribed in equilateral triangle ABC. Circle P is tangent to circle O and segments AB and BC. Find the area of circle P.

(A) 245π (B) 625π (C) 225 (D) 225π (E) 700



Problem 13. In the figure shown, ABC is a triangle with $AB = 15$, $BC = 14$, and $CA = 13$. Circle O has the center on AB. D and E are the tangent points. Find the distance from O to D.

(A) 56/9 (B) 6 (C) 56/3 (D) 56/11 (E) 9



Problem 14. In the figure, $\overline{BC}$ is the base of isosceles triangle ABC. $\overline{BC}$ is a diameter of the circle, point A is on the circle, $\overline{BC} \parallel \overline{DE}$, and $\overline{DE}$ is tangent to the

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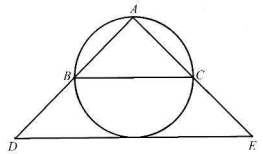
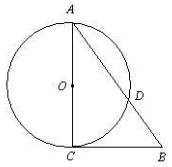
circle. What is the ratio of the area of triangle ABC to the area of trapezoid $BCED$?

(A) 1 : 4 (B) 1 : 5 (C) 2 : 5 (D) 1 : 3 (E) 3 : 4

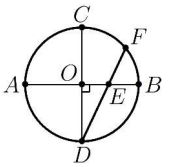


Problem 15. ΔABC, $\angle C = 90°$, $AB = 10$, $BC = 2\sqrt{5}$. AC is the diameter of the circle O. AB meets the circle O at D. Find CD.



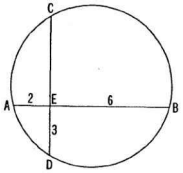
Problem 16. (AMC) In the figure, AB and CD are diameters of the circle with center O, $AB \perp CD$, and chord DF intersects AB at E. If $DE = 6$ and $EF = 2$, then the area of the circle is

(A) 23π (B) 47π/2 (C) 24π (D) 49π/2 (E) 25π



Problem 17. (AMC) Chords AB and CD in the circle (see figure) intersect at E and are perpendicular to each other. If segments AE, EB, and ED have measures 2, 6, and 3 respectively, then the length of the diameter of the circle is

(A) $4\sqrt{5}$ (B) $\sqrt{65}$ (C) $2\sqrt{17}$ (D) $3\sqrt{7}$ (E) $6\sqrt{2}$



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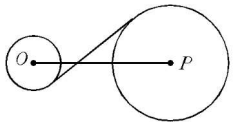
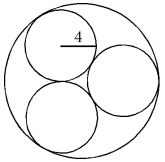
Problem 18. The centers of two circles, O and P, are 16 inches apart. The larger circle has a radius of 5 inches, and the smaller circle a radius of 3 inches. The length of the common internal tangent is:



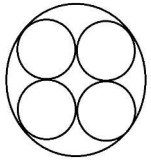
A. $10\sqrt{2}$ inches B. $6\sqrt{2}$ inches
C. $8\sqrt{2}$ D. $8\sqrt{2}$ inches E. $8\sqrt{3}$

Problem 19. Three circles each of radius 4 units are inscribed in a fourth circle in such a manner that the circles are mutually tangent to three other circles. The radius of the large circle is:



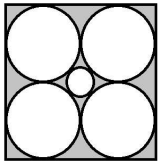
A. $\frac{2}{3}\sqrt{3}+4$ B. $\frac{4}{3}\sqrt{3}+4$ C. $\frac{32}{3}\sqrt{3}$ D. $\frac{16}{3}\sqrt{3}+8$
E. $\frac{8}{3}\sqrt{3}+4$

Problem 20. Four circles of radius *r* are mutually tangent inside a circle of radius one unit. The radius *r* is:



(A) 1 (B) 1/2 (C) $\sqrt{2}-1$ (D) 1/4 (E) $\frac{\sqrt{5}}{5}$

Problem 21. Four circles, each with radius 4 cm, are tangent to each other and tangent to an external square. A smaller circle is drawn tangent to each of the larger circles as shown. What is the number of square centimeters in the area of the shaded region?



(A) $256+(32\sqrt{2}-112)\pi$ (B) $256-112)\pi$
(C) $32\sqrt{2}+112\pi$ (D) $256+(32\sqrt{2}-102)\pi$
(E) $236+(32\sqrt{2}-112)\pi$

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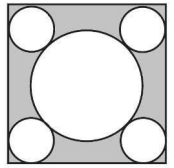
Problem 22. Four circles of radius 1 are each tangent to two sides of a square that is 6 on each side and externally tangent to a circle of radius *r*, as shown. What is the area of the shaded region?



(A) $18+(8\sqrt{2}-16)\pi$ (B) $36+(8\sqrt{2}-16)\pi$
(C) $36+8\sqrt{2}\pi$ (D) $(8\sqrt{2}-16)\pi$ (E) $36+16\sqrt{2}$