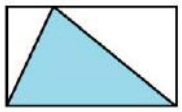
PROBLEMS

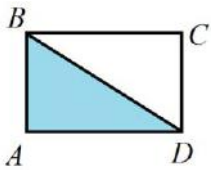
Problem 1. In the rectangle shown, the ratio of width to length is 1: 4. What percent of the rectangle is shaded?

(A) 80 (B) 20 (C) 50 (D) 44 (E) 30



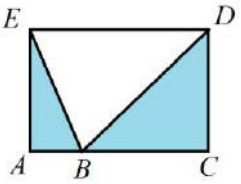
Problem 2. If the area of rectangle $ABCD$ is 24, find the area of ΔABD.

(A) 20 (B) 12 (C) 10 (D) 8 (E) 6



Problem 3. In rectangle $ACDE$, B lies on $\overline{AC}$, $DC = 4$ cm, and $DE = 8$ cm. Find the area of the shaded region.

(A) 16 cm^2 (B) 32 cm^2 (C) 64 cm^2 (D) 8 cm^2
(E) 10 cm^2



Problem 4. If the perimeter of an equilateral triangle is 60, what is the area of the triangle?

(A) $200\sqrt{3}$ (B) $100\sqrt{3}$ (C) 300 (D) 400 (E) $50\sqrt{3}$

Problem 5. The sides of a triangle are 5, 12, and 13. What is the number of square units in the area of the triangle?

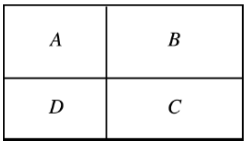
(A) 78 (B) 30 (C) 121 (D) 156 (E) 312

Problem 6. What is the number of square centimeters in the area of a triangle whose sides measure 8 cm, 15 cm, and 17 cm?

(A) 120 (B) 60 (C) 255 (D) 68 (E) 34

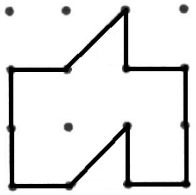
Problem 7. In the figure shown, the lengths and widths of rectangles A, B, C, and D are whole numbers. The areas of rectangles A, B, and C are 35, 45, and 36, respectively. What is the area of the entire figure?

(A) 144 (B) 121 (C) 100 (D) 162 (E) 28



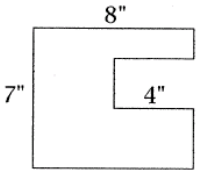
☆**Problem 8.** (AMC 8) Dots are spaced one unit apart, horizontally and vertically. The number of square units enclosed by the polygon is

(A) 5 (B) 6 (C) 7 (D) 8 (E) 9



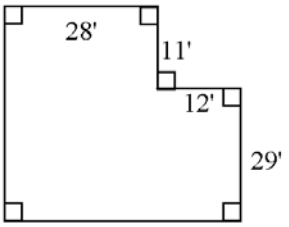
Problem 9. How many inches are in the perimeter of the following figure? All angles shown are right angles.

(A) 38 (B) 32 (C)3 (D) 48 (E) 24



Problem 10. How many square feet are there in the house with the dimensions shown in the figure?

(A) 1468 (B) 1600 (C) 900 (D) 1000 (E) 1100

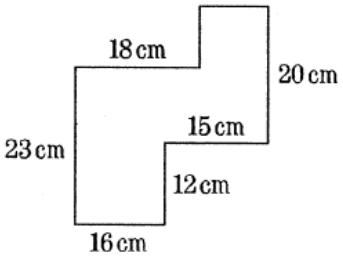


Problem 11. The perimeter of a rectangle is 46. The difference between the length and the width of the rectangle is 13. What is the area of the rectangle?

(A) 46 (B) 92 (C) 36 (D) 100 (E) 90

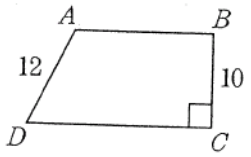
Problem 12. Given that all of the angles below are right angles, find the number of centimeters in the perimeter of the polygon.

(A) 136 (B) 129 (C) 125 (D) 126 (E) 128



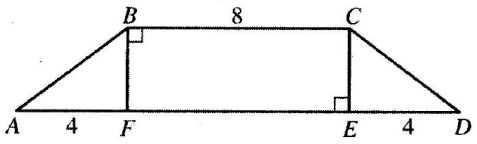
Problem 13. If the perimeter of trapezoid *ABCD* is 42 cm, what is the number of square centimeters in its area?

(A) 120 (B) 100 (C) 140 (D) 98 (E) 106



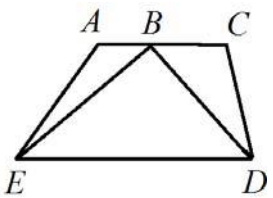
Problem 14. As shown in the figure, the area of trapezoid *ABCD* is 36. What is the length of *FB*?

(A) 8 (B) 2 (C) 4 (D) 3 (E) 5



Problem 15. Trapezoid *ACDE* has bases of lengths 16cm and 20 cm and area of 180 square centimeters. Δ*BDE* has the longer base of the trapezoid as one of its sides. *B* lies on the other base. Find the number of square centimeters in the area of Δ*EBD*.

(A) 200 (B) 140 (C) 100 (D) 180 (E) 120



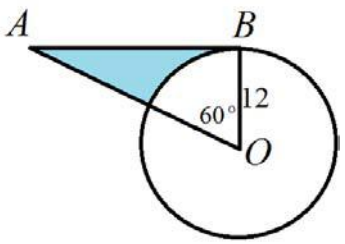
Problem 16. Find the area of a rhombus whose diagonals have length 4 and 9.

(A) 18 (B) 36 (C) 25 (D) 100 (E) 40

Problem 17. What is the radius of a circle whose perimeter is 64π cm?
(A) 64 (B) 32 (C) 16 (D) 8 (E) 128

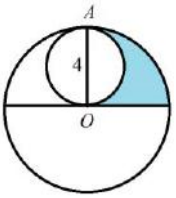
Problem 18. If the circumference of a circle is 8π, what is its area?
(A) 16π (B) 18π (C) 20π (D) 64π (E) 49π

Problem 19. In the figure, the center of the circle is O and $\overline{AB}$ is tangent to the circle at point B. What is the area of the shaded region?



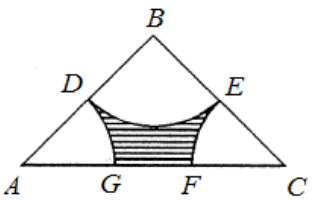
(A) $36\sqrt{3}-24\pi$ (B) $36\sqrt{3}-12\pi$
(C) $72\sqrt{3}-12\pi$ (D) $72\sqrt{3}-24\pi$
(E) $36\sqrt{3}-12\pi$

Problem 20. $\overline{OA}$ is the diameter of the smaller circle and the radius of the larger circle. How many square units are in the area of the shaded region?



(A) 16π (B) 8π (C) 4π (D) 2π (E) π

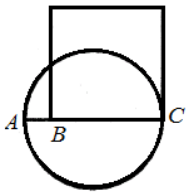
Problem 21. Isosceles right triangle ABC has legs of length 4cm with midpoints D and E. Three circles with centers A, B and C, respectively are drawn and the regions inside the triangle are shown. How many square centimeters are in the area of the shaded region?



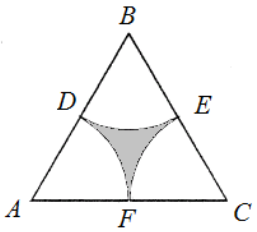
(A) 16 – π (B) 16 – 2 π (C) 8 – 2 π
(D) 8 – π (E) 8

Problem 22. A square is constructed on diameter $\overline{AC}$ such that the area of the square is equal to the area of the circle. What percent of $\overline{AC}$ is $\overline{BC}$?

(A) $\frac{\sqrt{\pi}}{2}$ (B) $\frac{\pi}{2}$ (C) $\frac{3}{4}$ (D) $\frac{3\pi}{4}$ (E) $2-\frac{\pi}{2}$



Problem 23. The length of a side of equilateral triangle ABC is 2. D, E, and F are the midpoints of $\overline{AB}$, $\overline{BC}$, and $\overline{AC}$, respectively. A, B, and C are the centers of the circles that contain arcs DF, DE, and FE, respectively. What is the area of the shaded region?

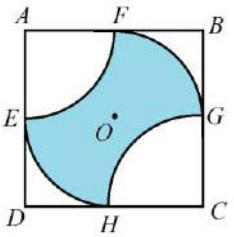


(A) $3\sqrt{2}-\frac{\pi}{2}$ (B) $\pi-\sqrt{3}$

(C) $2\sqrt{3}-\frac{\pi}{2}$ (D) $\sqrt{3}-\frac{\pi}{4}$

(E) $\sqrt{3}-\frac{\pi}{2}$

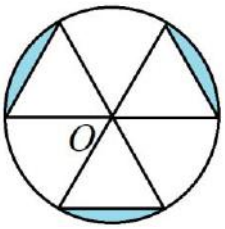
Problem 24. The figure shows a square with side of length 12. The center of the square is O, and E, F, G, and H are the midpoints of the sides. If the arcs shown have centers at A, O, and C, what is the area of the shaded region?



(A) 72 (B) $36+\frac{36\pi}{7}$ (C) 18π – 18

(D) 12π (E) 36 – 12π

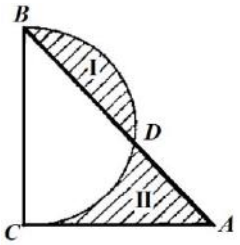
Problem 25. Circle O has a diameter of 20 cm and the triangles shown are equilateral. Find the percent of the circle that is shaded.



(A) $\frac{1}{2}-\frac{3\sqrt{3}}{2\pi}$ (B) $\frac{1}{2}-\frac{\sqrt{3}}{4\pi}$ (C) $\frac{1}{2}-\frac{\sqrt{3}}{\pi}$

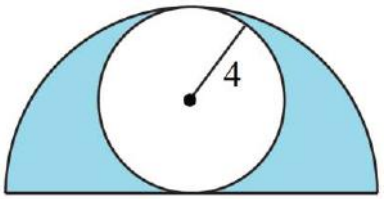
(D) $\frac{1}{2}-\frac{3\sqrt{3}}{4\pi}$ (E) $\frac{1}{2}-\frac{3\sqrt{3}}{\pi}$

Problem 26. As shown in the figure, right triangle ABC with $BC = 20\ cm$. BDC is a half circle with the diameter BC. The difference between two shaded areas I and II is 23. Find AC in terms of π.



☆**Problem 27.** A circle of radius 4 is inscribed in a semicircle, as shown. The area inside the semicircle but outside the circle is shaded. What fraction of the semicircle's area is shaded?

(A) $\frac{1}{2}$ (B) $\frac{5\pi}{6}$ (C) $\frac{2}{\pi}$ (D) $\frac{2\pi}{3}$ (E) $\frac{3}{\pi}$.



☆ **Problem 28.** In trapezoid $ABCD$, AD is perpendicular to DC, $AD = AB = 4$, and $DC = 8$. In addition, E is on DC, and BE is parallel to AD. Find the area of ΔBEC.

(A) 4 (B) 8 (C) 12 (D) 18 (E) 10