2012 Q24
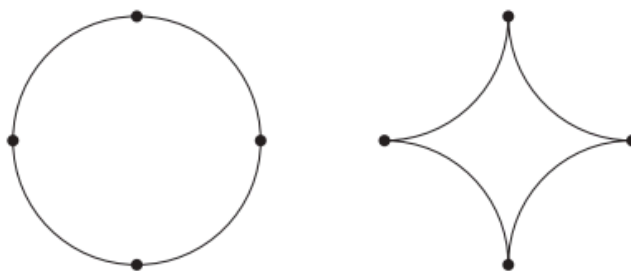
24. A circle of radius 2 is cut into four congruent arcs. The four arcs are joined to form the star figure shown. What is the ratio of the area of the star figure to the area of the original circle?

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

1993 Q25

25. A checkerboard consists of one-inch squares. A square card, 1.5 inches on a side, is placed on the board so that it covers part or all of the area of each of n squares. The maximum possible value of n is

(A) 4 or 5   (B) 6 or 7   (C) 8 or 9   (D) 10 or 11   (E) 12 or more

1996 Q25

25. A point is chosen at random from within a circular region. What is the probability that the point is closer to the center of the region than it is to the boundary of the region?

(A) 1/4   (B) 1/3   (C) 1/2   (D) 2/3   (E) 3/4

2003 Q25

25. In the figure, the area of square $WXYZ$ is 25 cm². The four smaller squares have sides 1 cm long, either parallel to or coinciding with the sides of the large square. In $\triangle ABC$, $AB = AC$, and when $\triangle ABC$ is folded over side $\overline{BC}$, point A coincides with O, the center of square $WXYZ$. What is the area of $\triangle ABC$, in square centimeters?
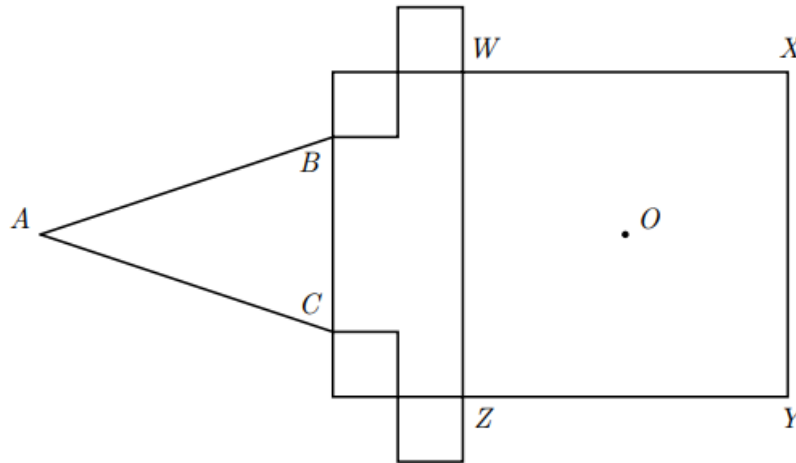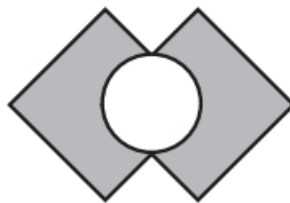

(A) $\frac{15}{4}$ (B) $\frac{21}{4}$ (C) $\frac{27}{4}$ (D) $\frac{21}{2}$ (E) $\frac{27}{2}$

2004 Q25

25. Two 4×4 squares intersect at right angles, bisecting their intersecting sides, as shown. The circle's diameter is the segment between the two points of intersection. What is the area of the shaded region created by removing the circle from the squares?
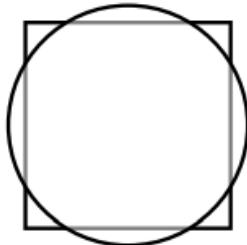

(A) $16 - 4\pi$ (B) $16 - 2\pi$ (C) $28 - 4\pi$ (D) $28 - 2\pi$ (E) $32 - 2\pi$

2

2005 Q25

25. A square with side length 2 and a circle share the same center. The total area of the regions that are inside the circle and outside the square is equal to the total area of the regions that are outside the circle and inside the square. What is the radius of the circle?

(A) $\frac{2}{\sqrt{\pi}}$ (B) $\frac{1+\sqrt{2}}{2}$ (C) $\frac{3}{2}$ (D) $\sqrt{3}$ (E) $\sqrt{\pi}$

2008 Q25

25. Margie's winning art design is shown. The smallest circle has radius 2 inches, with each successive circle's radius increasing by 2 inches. Approximately what percent of the design is black?
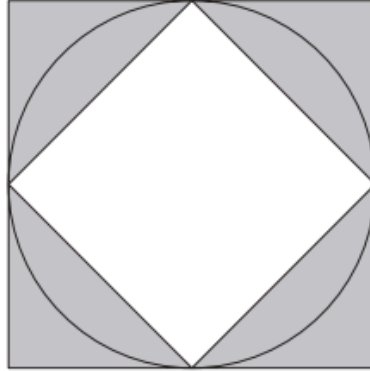

(A) 42   (B) 44   (C) 45   (D) 46   (E) 48

2011 Q25

25. A circle with radius 1 is inscribed in a square and circumscribed about another square as shown. Which fraction is closest to the ratio of the circle's shaded area to the shaded area between the two squares?

(A) $\dfrac{1}{2}$ (B) 1   (C) $\dfrac{3}{2}$ (D) 2   (E) $\dfrac{5}{2}$

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4

2013 Q25

25. A ball with diameter 4 inches starts at point A to roll along the track shown. The track is comprised of 3 semicircular arcs whose radii are $R_1 = 100$ inches, $R_2 = 60$ inches, and $R_3 = 80$ inches, respectively. The ball always remains in contact with the track and does not slip. What is the distance in inches the center of the ball travels over the course from A to B?

(A) 238π (B) 240π (C) 260π (D) 280π (E) 500π
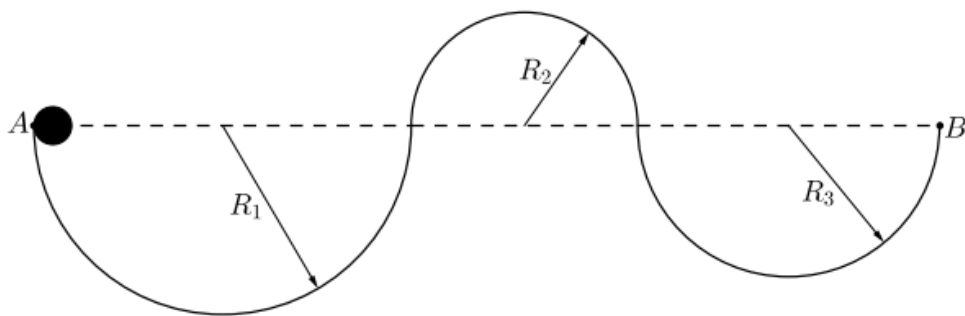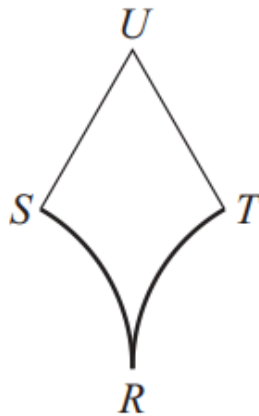
2016 Q25

25. A semicircle is inscribed in an isosceles triangle with base 16 and height 15 so that the diameter of the semicircle is contained in the base of the triangle as shown. What is the radius of the semicircle?
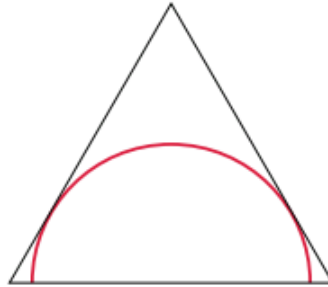
(A) $4\sqrt{3}$ (B) $\dfrac{120}{17}$ (C) 10   (D) $\dfrac{17\sqrt{2}}{2}$ (E) $\dfrac{17\sqrt{3}}{2}$

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6

2017 Q25

25. In the figure shown, $\overline{US}$ and $\overline{UT}$ are line segments each of length 2, and $m\angle TUS = 60°$. Arcs $\overarc{TR}$ and $\overarc{SR}$ are each one-sixth of a circle with radius 2. What is the area of the region shown?

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

(E) $4 + \dfrac{4\pi}{3}$