1992 Q16
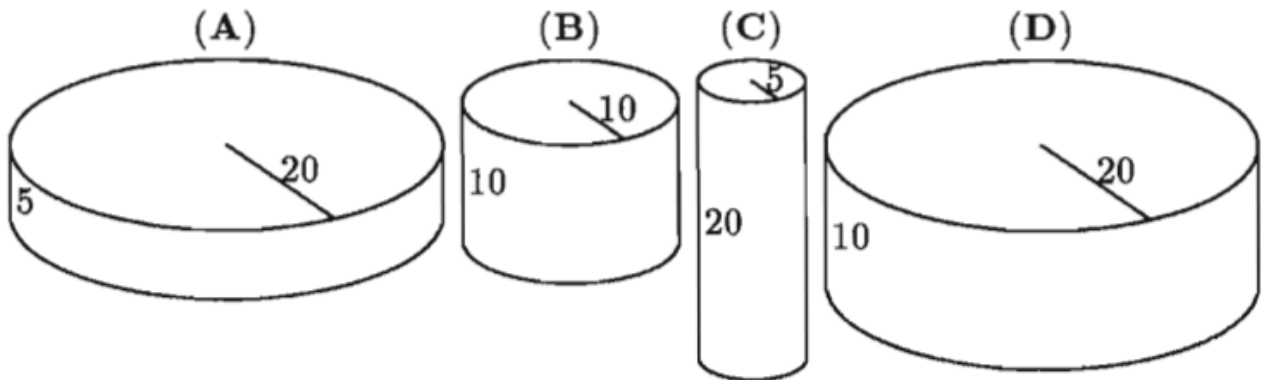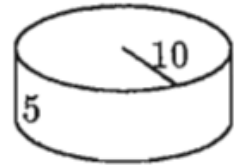
16. Which cylinder has twice the volume of the cylinder shown to the right?
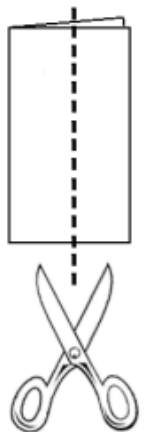

(A)   (B)   (C)   (D)

(E) None of the above

2001 Q16

16. A square piece of paper, 4 inches on a side, is folded in half vertically. Both layers are then cut in half parallel to the fold. Three new rectangles are formed, a large one and two small ones. What is the ratio of the perimeter of one of the small rectangles to the perimeter of the large rectangle?
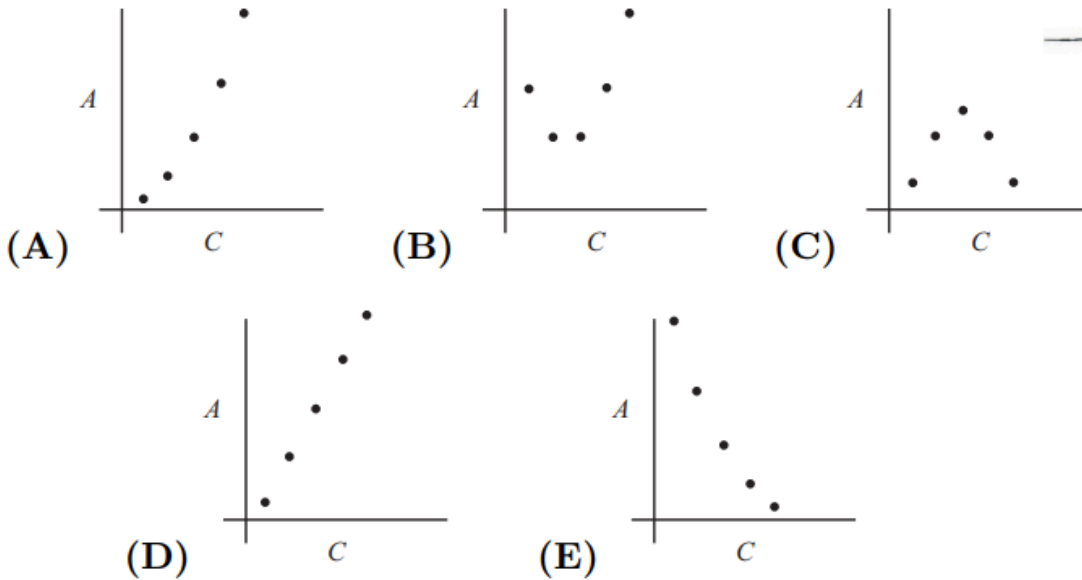
(A) $\frac{1}{3}$ (B) $\frac{1}{2}$ (C) $\frac{3}{4}$ (D) $\frac{4}{5}$ (E) $\frac{5}{6}$

2007 Q16

16. Amanda Reckonwith draws five circles with radii 1, 2, 3, 4 and 5. Then for each circle she plots the point (C, A), where C is its circumference and A is its area. Which of the following could be her graph?

(A)   (B)   (C)

(D)   (E)

1994 Q16

16. The perimeter of one square is 3 times the perimeter of another square. The area of the larger square is how many times the area of the smaller square?

(A) 2   (B) 3   (C) 4   (D) 6   (E) 9

2000 Q16

16. In order for Mateen to walk a kilometer(1000m) in his rectangular backyard, he must walk the length 25 times or walk its perimeter 10 times. What is the area of Mateen's backyard in square meters?
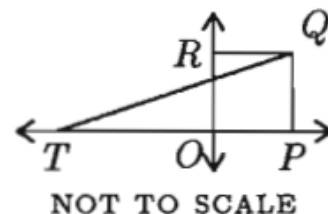
(A) 40   (B) 200   (C) 400   (D) 500   (E) 1000

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1996 Q17

17. Figure $OPQR$ is a square. Point O is the origin, and point Q has coordinates $(2,2)$. What are the coordinates for T so that the area of triangle PQT equals the area of square $OPQR$?

(A) $(-6,0)$ (B) $(-4,0)$ (C) $(-2,0)$

(D) $(2,0)$ (E) $(4,0)$

NOT TO SCALE

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1986 Q18

18. A rectangular grazing area is to be fenced off on three sides using part of a 100 meter rock wall as the fourth side. Fence posts are to be placed every 12 meters along the fence including the two posts where the fence meets the rock wall. What is the fewest number of posts required to fence an area 36 m by 60 m?
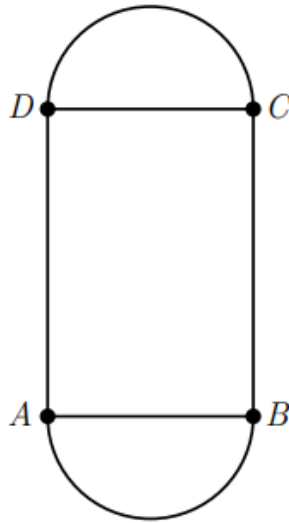
A) 11   B) 12   C) 13   D) 14   E) 16

WALL

8 / 16

3
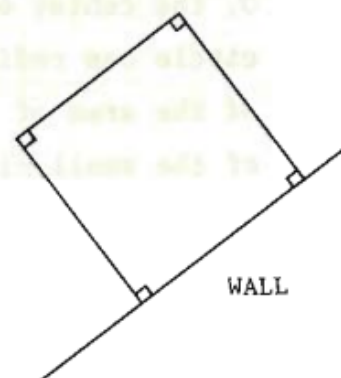
2010 Q18

18. A decorative window is made up of a rectangle with semicircles on either end. The ratio of AD to AB is $3:2$ and $AB = 30$ inches. What is the ratio of the area of the rectangle to the combined areas of the semicircles?
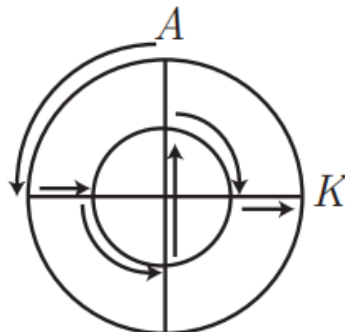

(A) $2:3$ **(B)** $3:2$ **(C)** $6:\pi$ **(D)** $9:\pi$ **(E)** $30:\pi$

2008 Q18

18. Two circles that share the same center have radii 10 meters and 20 meters. An aardvark runs along the path shown, starting at A and ending at K. How many meters does the aardvark run?

(A) $10\pi + 20$ **(B)** $10\pi + 30$ **(C)** $10\pi + 40$ **(D)** $20\pi + 20$ **(E)** $20\pi + 40$

4

1994 Q19

19. Around the outside of a 4 by 4 square, construct four semicircles (as shown in the figure) with the four sides of the square as their diameters. Another square, $ABCD$, has its sides parallel to the corresponding sides of the original square, and each side of $ABCD$ is tangent to one of the semicircles. The area of the square $ABCD$ is
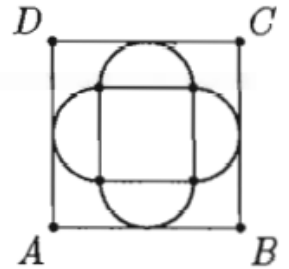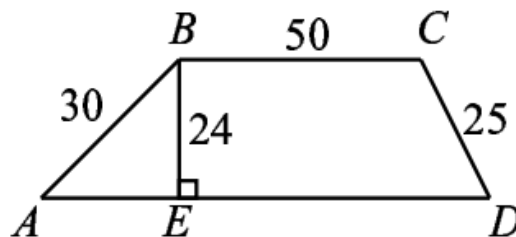
(A) 16   (B) 32   (C) 36   (D) 48   (E) 64

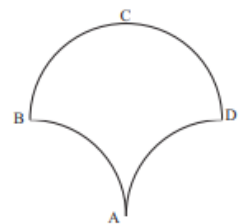## 2005 Q19

19. What is the perimeter of trapezoid $ABCD$?

(A) 180   (B) 188   (C) 196   (D) 200   (E) 204

2000 Q19

19. Three circular arcs of radius 5 units bound the region shown. Arcs AB and AD are quarter-circles, and arc BCD is a semicircle. What is the area, in square units, of the region?
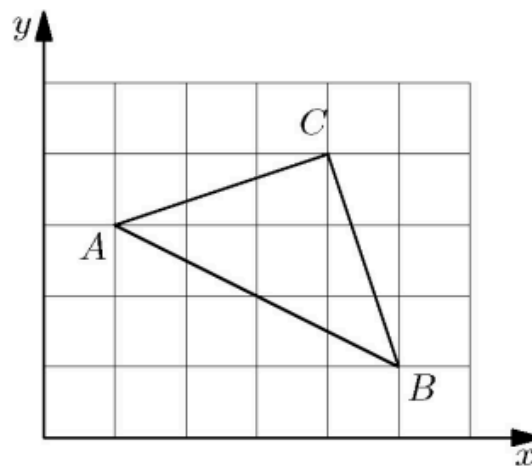
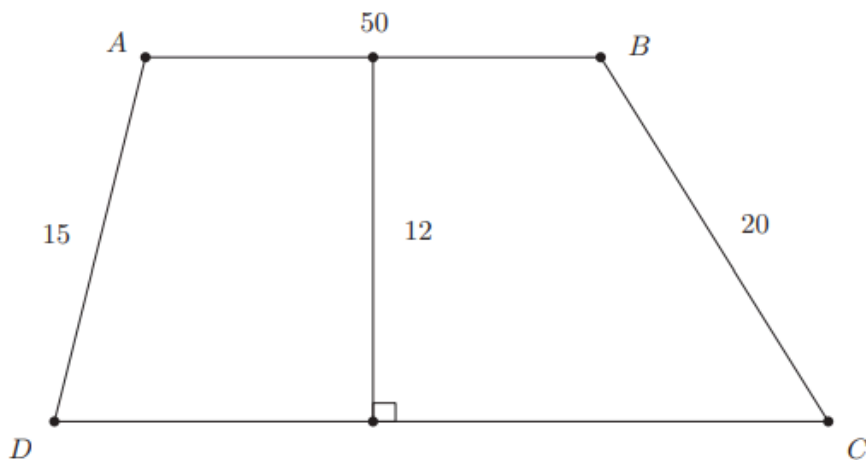(A) 25   (B) $10 + 5\pi$ (C) 50   (D) $50 + 5\pi$

(E) 25π

5

2015 Q19

19. A triangle with vertices at $A = (1, 3)$, $B = (5, 1)$, and $C = (4, 4)$ is plotted on a 6×5 grid. What fraction of the grid is covered by the triangle?

(A) $\dfrac{1}{6}$ (B) $\dfrac{1}{5}$ (C) $\dfrac{1}{4}$ (D) $\dfrac{1}{3}$ (E) $\dfrac{1}{2}$

6

2011 Q20

20. Quadrilateral $ABCD$ is a trapezoid, $AD = 15$, $AB = 50$, $BC = 20$, and the altitude is 12. What is the area of the trapezoid?

(A) 600   (B) 650   (C) 700   (D) 750   (E) 800

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2013 Q20

20. A 1×2 rectangle is inscribed in a semicircle with the longer side on the diameter. What is the area of the semicircle?

(A) $\dfrac{\pi}{2}$ (B) $\dfrac{2\pi}{3}$ (C) π (D) $\dfrac{4\pi}{3}$ (E) $\dfrac{5\pi}{3}$

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2014 Q20

20. Rectangle $ABCD$ has sides $CD = 3$ and $DA = 5$. A circle of radius 1 is centered at A, a circle of radius 2 is centered at B, and a circle of radius 3 is centered at C. Which of the following is closest to the area of the region inside the rectangle but outside all three circles?

(A) 3.5   (B) 4.0   (C) 4.5   (D) 5.0   (E) 5.5