1 / 15

2005 Q21

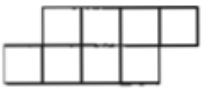
21. How many distinct triangles can be drawn using three of the dots below as vertices?

(A) 9 **(B)** 12 **(C)** 18 **(D)** 20 **(E)** 24

2 / 15

1992 Q22

22. Eight 1×1 square tiles are arranged as shown so their outside edges form a polygon with a perimeter of 14 units. Two additional tiles of the same size are added to the figure so that at least one side of each tile is shared with a side of one of the squares in the original figure. Which of the following could be the perimeter of the new figure?



(A) 15 **(B)** 17 **(C)** 18 **(D)** 19 **(E)** 20

3 / 15

2007 Q22

22. A lemming sits at a corner of a square with side length 10 meters. The lemming runs 6.2 meters along a diagonal toward the opposite corner. It stops, makes a 90° right turn and runs 2 more meters. A scientist measures the shortest distance between the lemming and each side of the square. What is the average of these four distances in meters?

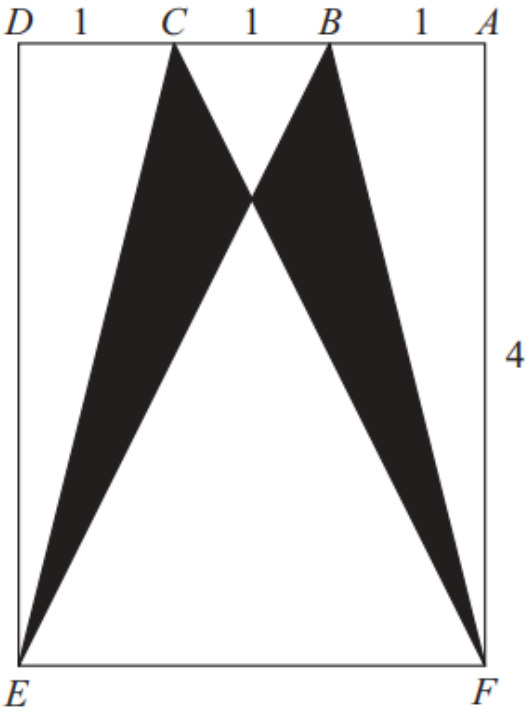
(A) 2 **(B)** 4.5 **(C)** 5 **(D)** 6.2 **(E)** 7

4 / 15

2016 Q22

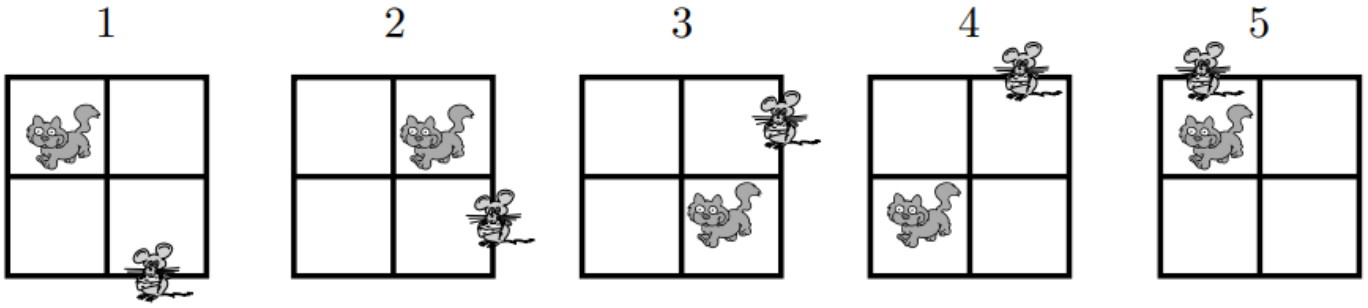
22. Rectangle $DEFA$ below is a 3×4 rectangle with $DC = CB = BA = 1$. The area of the "bat wings" (the shaded area) is

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

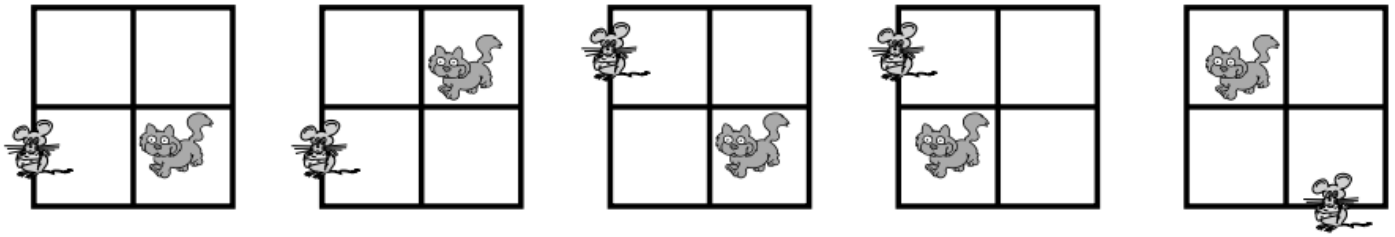


2003 Q23

23. In the pattern below, the cat moves clockwise through the four squares and the mouse moves counterclockwise through the eight exterior segments of the four squares.

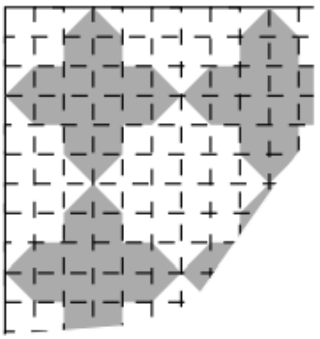


If the pattern is continued, where would the cat and mouse be after the 247th move?



2002 Q23

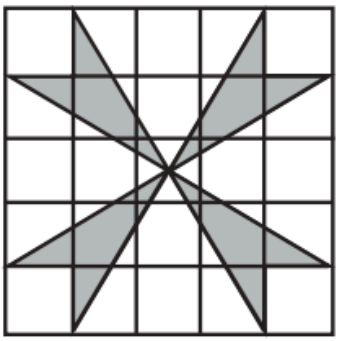
23. A corner of a tiled floor is shown. If the entire floor is tiled in this way and each of the four corners looks like this one, then what fraction of the tiled floor is made of darker tiles?



(A) $\frac{1}{3}$ **(B)** $\frac{4}{9}$ **(C)** $\frac{1}{2}$ **(D)** $\frac{5}{9}$ **(E)** $\frac{5}{8}$

2007 Q23

23. What is the area of the shaded pinwheel shown in the 5×5 grid?

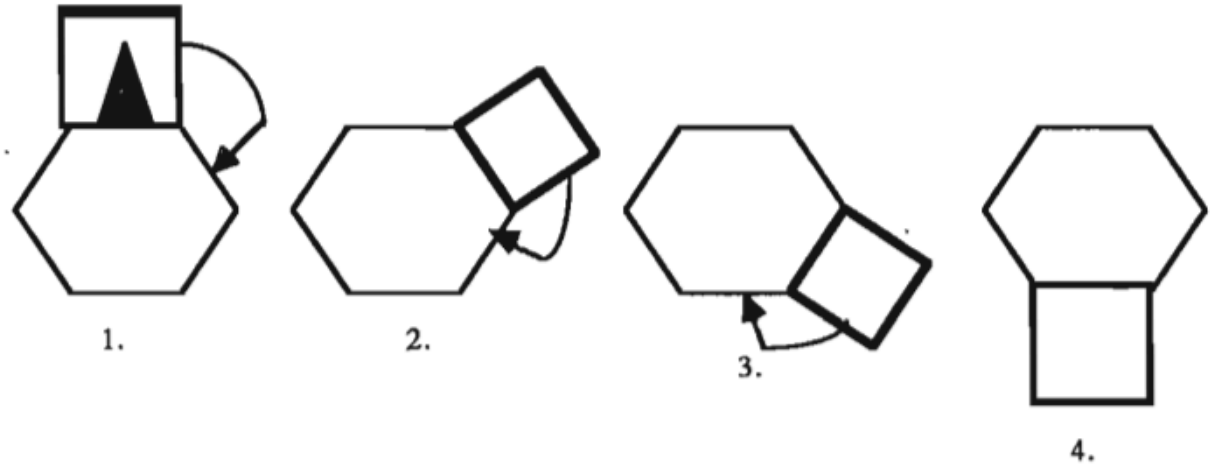


(A) 4 **(B)** 6 **(C)** 8 **(D)** 10 **(E)** 12

8 / 15

1988 Q24

24.



The square in the first diagram "rolls" clockwise around the fixed regular hexagon until it reaches the bottom. In which position will the solid triangle be in diagram 4?

A)  B)  C)  D)  E) 

9 / 15

1993 Q24

24. What number is directly above 142 in this array of numbers?

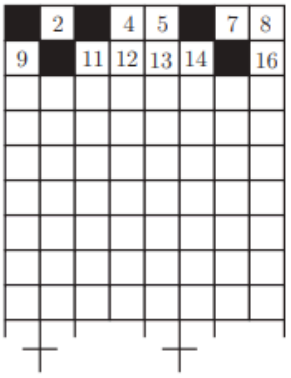
$$\begin{array}{ccccc} & & 1 & & \\ & 2 & 3 & 4 & \\ 5 & 6 & 7 & 8 & 9 \\ 10 & 11 & 12 & \cdots & \end{array}$$

(A) 99 **(B)** 119 **(C)** 120 **(D)** 121 **(E)** 122

10 / 15

1998 Q24

24. A rectangular board of 8 columns has squares numbered beginning in the upper left corner and moving left to right so row one is numbered 1 through 8, row two is 9 through 16, and so on. A student shades square 1, then skips one square and shades square 3, skip two squares and shades square 6, ships 3 squares and shades square 10, and continues in this way until there is at least one shaded square in each column. What is the number of the shaded square that first achieves this result?

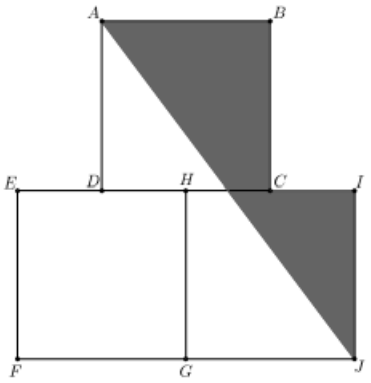


(A) 36 **(B)** 64 **(C)** 78 **(D)** 91 **(E)** 120

11 / 15

2013 Q24

24. Squares $ABCD$, $EFGH$, and $GHIJ$ are equal in area. Points C and D are the midpoints of sides IH and HE, respectively. What is the ratio of the area of the shaded pentagon $AJICB$ to the sum of the areas of the three squares?

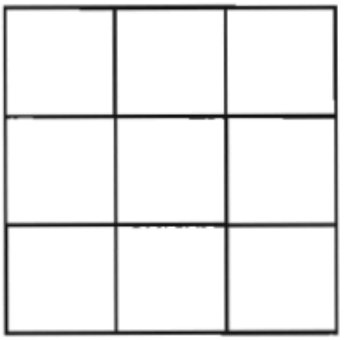


(A) $\frac{1}{4}$ **(B)** $\frac{7}{24}$ **(C)** $\frac{1}{3}$ **(D)** $\frac{3}{8}$ **(E)** $\frac{5}{12}$

1990 Q25

25. How many different patterns can be made by shading exactly two of the nine squares? Patterns that can be matched by flips and/or turns are not considered different. For example, the patterns shown below are **not** considered different.

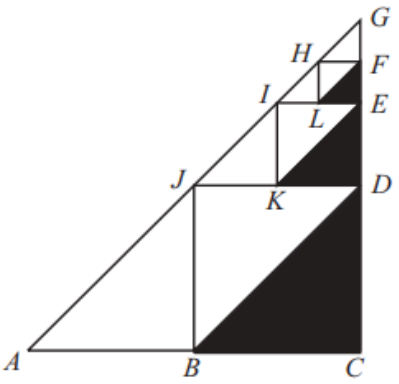
A) 3 B) 6 C) 8 D) 12 E) 18



1999 Q25

25. Points B, D, and J are midpoints of the sides of right triangle ACG. Points K, E, I are midpoints of the sides of triangle JDG, etc. If the dividing and shading process is done 100 times(the first three are shown) and $AC = CG = 6$, then the total area of the shaded triangles is nearest

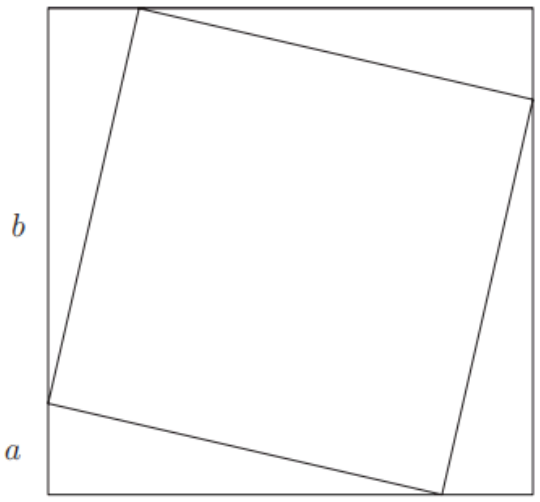
(A) 6 **(B)** 7 **(C)** 8 **(D)** 9 **(E)** 10



14 / 15

2012 Q25

25. A square with area 4 is inscribed in a square with area 5, with one vertex of the smaller square on each side of the larger square. A vertex of the smaller square divides a side of the larger square into two segments, one of length a and the other of length b. What is the value of ab?



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

15 / 15

2015 Q25

25. One-inch squares are cut from the corners of this 5 inch square. What is the area in square inches of the largest square that can be fitted into the remaining space?

(A) 9 **(B)** $12\frac{1}{2}$ **(C)** 15 **(D)** $15\frac{1}{2}$ **(E)** 17