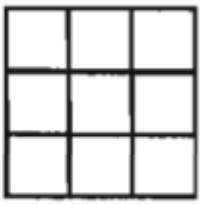
1 / 13

1988 Q16

16. Placing no more than one X in each small square, what is the greatest number of X's that can be put on the grid shown without getting three X's in a row vertically, horizontally, or diagonally?



A) 2 B) 3 C) 4

D) 5 E) 6

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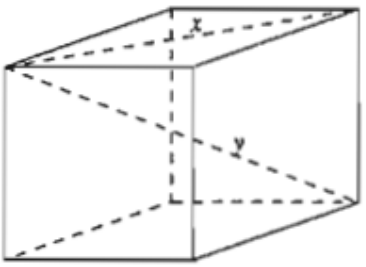
1997 Q17

17. A cube has eight vertices (corners) and twelve edges. A segment, such as x, which joins two vertices not joined by an edge is called a diagonal. Segment y is also a diagonal. How many diagonals does a cube have?



(A) 6 **(B)** 8 **(C)** 12 **(D)** 14 **(E)** 16

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1990 Q17

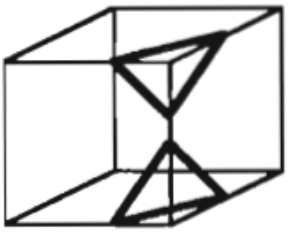
17. A straight concrete sidewalk is to be 3 feet wide, 60 feet long and 3 **inches** thick. How many cubic yards of concrete must a contractor order for the sidewalk if concrete must be ordered in a whole number of cubic yards?

A) 2 B) 5 C) 12 D) 20 E) more than 20

1990 Q18

18. Each corner of a rectangular prism is cut off. Two (of the eight) cuts are shown. How many edges does the new figure have?

A) 24 B) 30 C) 36 D) 42 E) 48



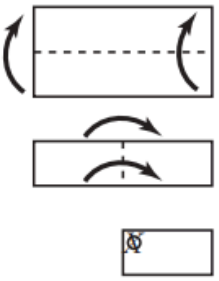
2006 Q18

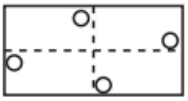
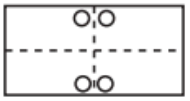
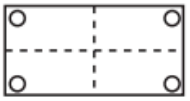
18. A cube with 3-inch edges is made using 27 cubes with 1-inch edges. Nineteen of the smaller cubes are white and eight are black. If the eight black cubes are placed at the corners of the larger cube, what fraction of the surface area of the larger cube is white?

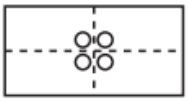
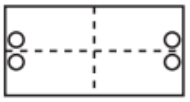
(A) $\frac{1}{9}$ **(B)** $\frac{1}{4}$ **(C)** $\frac{4}{9}$ **(D)** $\frac{5}{9}$ **(E)** $\frac{19}{27}$

1998 Q18

18. As indicated by the diagram at the right, a rectangular piece of paper is folded bottom to top, then left to right, and finally, a hole is punched at X. What does the paper look like when unfolded?

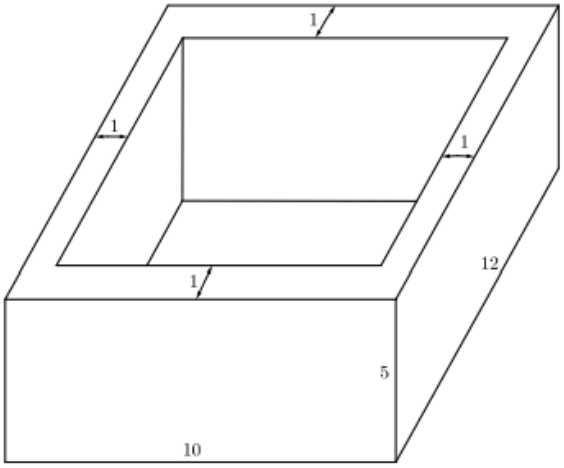


(A)  **(B)**  **(C)** 

(D)  **(E)** 

2013 Q18

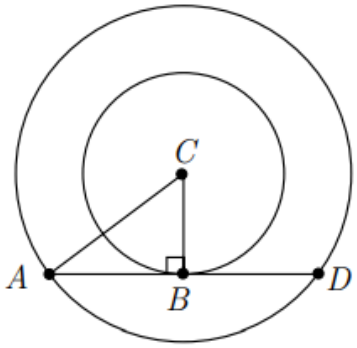
18. Isabella uses one-foot cubical blocks to build a rectangular fort that is 12 feet long, 10 feet wide, and 5 feet high. The floor and the four walls are all one foot thick. How many blocks does the fort contain?



(A) 204 **(B)** 280 **(C)** 320 **(D)** 340 **(E)** 600

2010 Q19

19. The two circles pictured have the same center C. Chord $\overline{AD}$ is tangent to the inner circle at B, AC is 10, and chord $\overline{AD}$ has length 16. What is the area between the two circles?



(A) 36π **(B)** 49π **(C)** 64π **(D)** 81π **(E)** 100π

2014 Q19

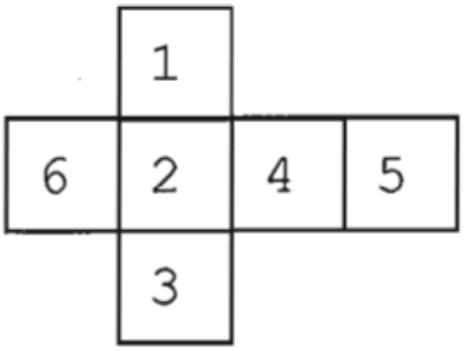
19. A cube with 3-inch edges is to be constructed from 27 smaller cubes with 1-inch edges. Twenty-one of the cubes are colored red and 6 are colored white. If the 3-inch cube is constructed to have the smallest possible white surface area showing, what fraction of the surface area is white?

(A) $\frac{5}{54}$ **(B)** $\frac{1}{9}$ **(C)** $\frac{5}{27}$ **(D)** $\frac{2}{9}$ **(E)** $\frac{1}{3}$

1989 Q20

20. The figure may be folded along the lines shown to form a number cube. Three number faces come together at each corner of the cube. What is the largest sum of three numbers whose faces come together at a corner?

A) 11 B) 12 C) 13 D) 14 E) 15



1999 Q20

20. Figure 1 is called a "stack map." The numbers tell how many cubes are stacked in each position. Fig. 2 shows these cubes, and Fig. 3 shows the view of the stacked cubes as seen from the front.
Which of the following is the front view for the stack map in Fig. 4?

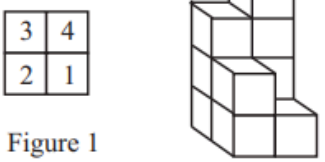


Figure 1

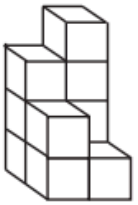


Figure 2

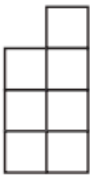


Figure 3

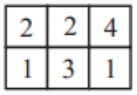
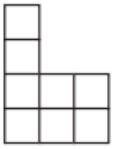
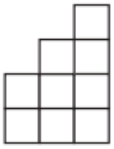
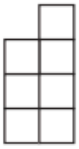
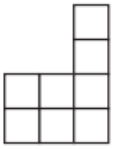
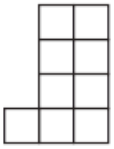
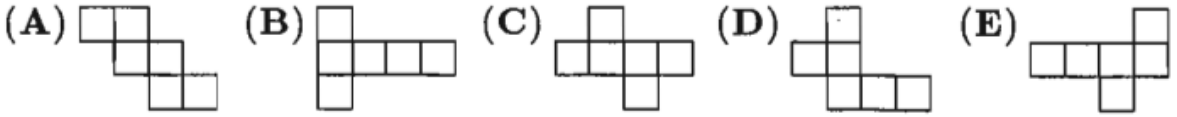


Figure 4

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

1992 Q20

20. Which pattern of identical squares could NOT be folded along the lines shown to form a cube?



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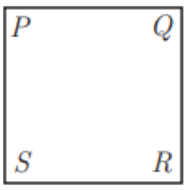
1998 Q20

20. Let $PQRS$ be a square piece of paper. P is folded onto R and then Q is folded onto S. The area of the resulting figure is 9 square inches. Find the perimeter of square $PQRS$.



(A) 9 **(B)** 16 **(C)** 18 **(D)** 24 **(E)** 36