

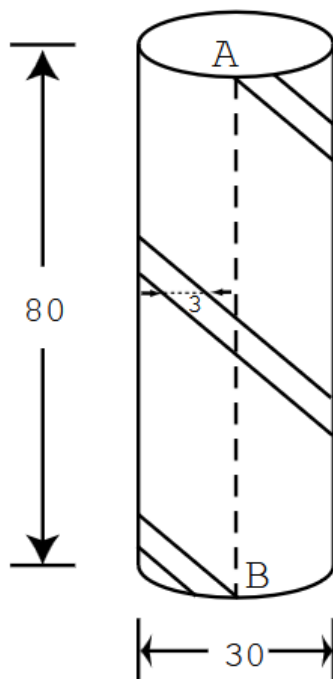
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3D GEOMETRY

- 2016B
17. All the numbers 2, 3, 4, 5, 6, 7 are assigned to the six faces of a cube, one number to each face. For each of the eight vertices of the cube, a product of three numbers is computed, where the three numbers are the numbers assigned to the three faces that include that vertex. What is the greatest possible value of the sum of these eight products?
- (A) 312 (B) 343 (C) 625 (D) 729 (E) 1680
- 2010A
17. A solid cube has side length 3 inches. A 2-inch by 2-inch square hole is cut into the center of each face. The edges of each cut are parallel to the edges of the cube, and each hole goes all the way through the cube. What is the volume, in cubic inches, of the remaining solid?
- (A) 7 (B) 8 (C) 10 (D) 12 (E) 15

- 2002A 18. A $3 \times 3 \times 3$ cube is formed by gluing together 27 standard cubical dice. (On a standard die, the sum of the numbers on any pair of opposite faces is 7.) The smallest possible sum of all the numbers showing on the surface of the $3 \times 3 \times 3$ cube is
- (A) 60 (B) 72 (C) 84 (D) 90 (E) 96

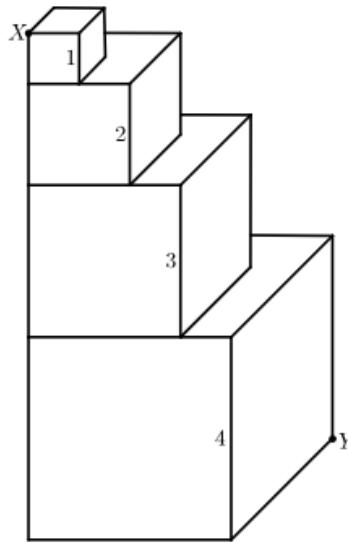
- 2004A 19. A white cylindrical silo has a diameter of 30 feet and a height of 80 feet. A red stripe with a horizontal width of 3 feet is painted on the silo, as shown, making two complete revolutions around it. What is the area of the stripe in square feet?



- (A) 120 (B) 180 (C) 240 (D) 360 (E) 480
- 2008B 19. A cylindrical tank with radius 4 feet and height 9 feet is lying on its side. The tank is filled with water to a depth of 2 feet. What is the volume of the water, in cubic feet?
- (A) $24\pi - 36\sqrt{2}$ (B) $24\pi - 24\sqrt{3}$ (C) $36\pi - 36\sqrt{3}$ (D) $36\pi - 24\sqrt{2}$
 (E) $48\pi - 36\sqrt{3}$

2014A

19. Four cubes with edge lengths 1, 2, 3, and 4 are stacked as shown. What is the length of the portion of \overline{XY} contained in the cube with edge length 3?



- (A) $\frac{3\sqrt{33}}{5}$ (B) $2\sqrt{3}$ (C) $\frac{2\sqrt{33}}{3}$ (D) 4 (E) $3\sqrt{2}$