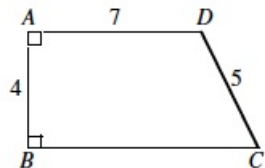


Pascal and Cayley Contest Preparation

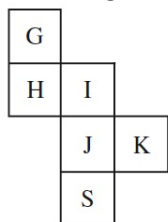
Problem Set 5

1. In the diagram, $AD < BC$. What is the perimeter of $ABCD$?



- (A) 23 (B) 26 (C) 27 (D) 28 (E) 30

2. If the figure is folded to make a cube, what letter is opposite G?

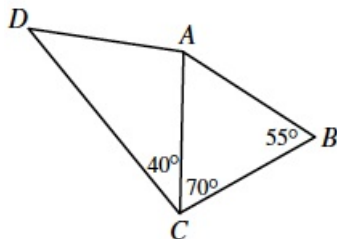


- (A) S (B) H (C) I (D) J (E) K

3. A store had a sale on T-shirts. For every two T-shirts purchased at the regular price, a third T-shirt was bought for \$1.00. Twelve T-shirts were bought for \$120.00. What was the regular price for one T-shirt?

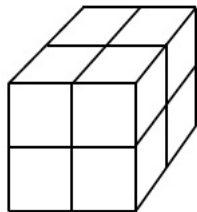
- (A) \$10.00 (B) \$13.50 (C) \$14.00 (D) \$14.50 (E) \$15.00

4. In the diagram, $DA = CB$. What is the measure of $\angle DAC$?



- (A) 70° (B) 100° (C) 95° (D) 125° (E) 110°

5. Eight unit cubes are used to form a large 2 by 2 by 2 cube. The six faces of this larger cube are then painted red. When the paint is dry, the larger cube is taken apart. What fraction of the total surface area of the unit cubes is red?



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

6. When 14 is divided by 5, the remainder is 4. When 14 is divided by the positive integer n , the remainder is 2. For how many different values of n is this possible?

- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5

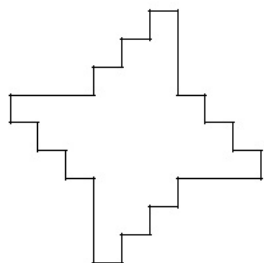
7. A gardener has a push mower and a riding mower. It takes her five hours to cut the entire lawn the the push mower but only 70 minutes with the riding mower. After 90% of the lawn was cut using the riding mower, the remainder was cut using the push mower. How many minutes did it take to cut the lawn?

- (A) 120 (B) 75 (C) 70 (D) 277 (E) 93

8. How many integers are between $\sqrt{40}$ and $\sqrt{400}$?

- (A) 12 (B) 13 (C) 14 (D) 15 (E) 16

9. In the diagram, adjacent edges are at right angles. The four longer edges are equal in length, and all of the shorter edges are also equal in length. The area of the shape is 528. What is the perimeter?



- (A) 132 (B) 264 (C) 92 (D) 72 (E) 144

10. The digits 1, 2, 3, 4, 5 and 6 are each used once to compose a six digit number $abcdef$, such that the three digit number abc is divisible by 4, bcd is divisible by 5, cde is divisible by 3, and def is divisible by 11. The digit a is

- (A) 1 (B) 2 (C) 3 (D) 4 (E) 6

11. If n is a positive integer and $n(n + 1)$ is divided by 3, the remainder can be

- (A) 0 only (B) 2 only (C) 0 or 1 only (D) 0 or 2 only (E) 0, 1, or 2

12. Suppose that a, b and c are three numbers with

$$a + b = 3$$

$$ac + b = 18$$

$$bc + a = 6$$

The value of c is

- (A) 2 (B) 11 (C) 3 (D) 6 (E) 7