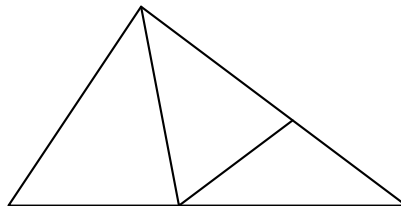**Easy**

1. How many triangles are in this figure? (Some triangles may overlap other triangles.)


(A) 9   (B) 8   (C) 7   (D) 6   (E) 5

2. A group of children riding on bicycles and tricycles rode past Billy Bob's house. Billy Bob counted 7 children and 19 wheels. How many tricycles were there?

(A) 2   (B) 4   (C) 5   (D) 6   (E) 7

3. When a fair six-sided die is tossed on a table top, the bottom face cannot be seen. What is the probability that the product of the numbers on the five faces that can be seen is divisible by 6?

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

4. Fourteen white cubes are put together to form the figure on the right. The complete surface of the figure, including the bottom, is painted red. The figure is then separated into individual cubes. How many of the individual cubes have exactly four red faces?
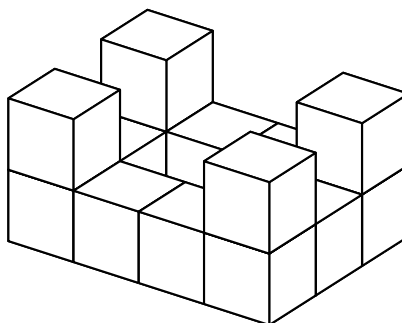
(A) 4   **(B)** 6   **(C)** 8   **(D)** 10   **(E)** 12

5. Three students, with different names, line up single file. What is the probability that they are in alphabetical order from front-to-back?

(A) $\dfrac{1}{12}$ (B) $\dfrac{1}{9}$ (C) $\dfrac{1}{6}$ (D) $\dfrac{1}{3}$ (E) $\dfrac{2}{3}$

6. Ali, Bonnie, Carlo, and Dianna are going to drive together to a nearby theme park. The car they are using has 4 seats: 1 Driver seat, 1 front passenger seat, and 2 back passenger seat. Bonnie and Carlo are the only ones who know how to drive the car. How many possible seating arrangements are there?

(A) 2   **(B)** 4   **(C)** 6   **(D)** 12   **(E)** 24

7. How many different combinations of 5 dollar bills and 2 dollar bills can be used to make a total of 17 dollars? Order does not matter in this problem.

(A) 2   (B) 3   (C) 4   (D) 5   (E) 6

8. How many positive factors of 36 are also multiples of 4?

(A) 2   (B) 3   (C) 4   (D) 5   (E) 6

9. A circle and two distinct lines are drawn on a sheet of paper. What is the largest possible number of points of intersection of these figures?

(A) 2   (B) 3   (C) 4   (D) 5   (E) 6

Medium

1. An Annville Junior High School, 30% of the students in the Math Club are in the Science Club, and 80% of the students in the Science Club are in the Math Club. There are 15 students in the Science Club. How many students are in the Math Club?

(A) 12   (B) 15   (C) 30   (D) 36   (E) 40

2. A sequence of squares is made of identical square tiles. The edge of each square is one tile length longer than the edge of the previous square. The first three squares are shown. How many more tiles does the seventh square require than the sixth?
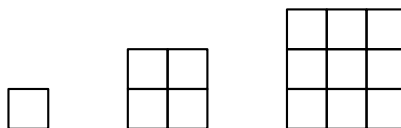
(A) 11   (B) 12   (C) 13   (D) 14   (E) 15

3. For how many three-digit whole numbers does the sum of the digits equal 25?

(A) 2   (B) 4   (C) 6   (D) 8   (E) 10

4. A board game spinner is divided into three regions labeled A, B and C. The probability of the arrow stopping on region A is $\frac{1}{3}$ and on region B is $\frac{1}{2}$. The probability of the arrow stopping on region C is

(A) $\frac{1}{12}$ (B) $\frac{1}{6}$ (C) $\frac{1}{5}$ (D) $\frac{1}{3}$ (E) $\frac{2}{5}$

5. Last summer 100 students attended basketball camp. Of those attending, 52 were boys and 48 were girls. Also, 40 students were from Jonas Middle School and 60 were from Clay Middle School. Twenty of the girls were from Jonas Middle School. How many of the boys were from Clay Middle School?

(A) 20   (B) 32   (C) 40   (D) 48   (E) 52

6. A gumball machine contains 9 red, 7 white, and 8 blue gumballs. The least number of gumballs a person must buy to be sure of getting four gumballs of the same color is

(A) 8   (B) 9   (C) 10   (D) 12   (E) 18

7. How many integers between 1000 and 2000 have all three of the numbers 15, 20, and 25 as factors?

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

Hard

1. Tamika selects two different numbers at random from the set $\{8, 9, 10\}$ and adds them. Carlos takes two different numbers at random from the set $\{3, 5, 6\}$ and multiplies them. What is the probability that Tamika's result is greater than Carlos' result?

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

2. How many whole numbers between 99 and 999 contain exactly one 0?

(A) 72   (B) 90   (C) 144   (D) 162   (E) 180

3. A pair of 8-sided dice have sides numbered 1 through 8. Each side has the same probability (chance) of landing face up. The probability that the product of the two numbers that land face-up exceeds 36 is

(A) $\dfrac{5}{32}$ (B) $\dfrac{11}{64}$ (C) $\dfrac{3}{16}$ (D) $\dfrac{1}{4}$ (E) $\dfrac{1}{2}$

4. How many subsets containing three different numbers can be selected from the set

$$\{89, 95, 99, 132, 166, 173\}$$

so that the sum of the three numbers is even?

(A) 6   (B) 8   (C) 10   (D) 12   (E) 24

5. A point is chosen at random from within a circular region. What is the probability that the point is closer to the center of the region than it is to the boundary of the region?

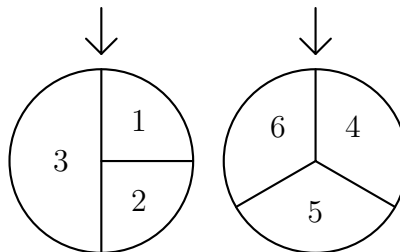(A) 1/4   (B) 1/3   (C) 1/2   (D) 2/3   (E) 3/4

6. Diana and Apollo each roll a standard die obtaining a number at random from 1 to 6. What is the probability that Diana's number is larger than Apollo's number?

(A) $\dfrac{1}{3}$ (B) $\dfrac{5}{12}$ (C) $\dfrac{4}{9}$ (D) $\dfrac{17}{36}$ (E) $\dfrac{1}{2}$

7. How many four-digit whole numbers are there such that the leftmost digit is odd, the second digit is even, and all four digits are different?

(A) 1120   (B) 1400   (C) 1800   (D) 2025   (E) 2500

8. The two wheels shown below are spun and the two resulting numbers are added. The probability that the sum is even is

(A) $\dfrac{1}{6}$ (B) $\dfrac{1}{4}$ (C) $\dfrac{1}{3}$ (D) $\dfrac{5}{12}$ (E) $\dfrac{4}{9}$