1. Sarah chose a random integer between 1000 and 9999, inclusive. What is the probability that the integer is odd and all of its digits are distinct?
   (A) $\frac{14}{75}$ (B) $\frac{56}{225}$ (C) $\frac{107}{400}$ (D) $\frac{7}{25}$ (E) $\frac{9}{25}$

2. John plays soccer once every three days, plays basketball once every four days and plays voleyball every five days. He played all three sports on December 31st, 2018. How many days in 2019 did John not play any of the sports?
   (A) 78 (B) 146 (C) 144 (D) 80 (E) 152

3. Two congruent circles centered at points A a nd B each pass through the other circle's center. The line containing both A and B is extended to intersect the circles at points C and D . The circles intersect at two points, one of which is E . What is the degree measure of $\angle CED$?
   (A) $100°$ (B) $120°$ (C) $130°$ (D) $135°$ (E) $150°$

4. A semicircle is inscribed in an isosceles triangle with base 16 and height 15 so that the diameter of the semicircle is contained in the base of the triangle as shown. What is the radius of the semicircle?
   (A) $4\sqrt{3}$ (B) $\frac{17\sqrt{2}}{2}$ (C) $\frac{17\sqrt{3}}{2}$ (D) 10 (E) $\frac{120}{17}$
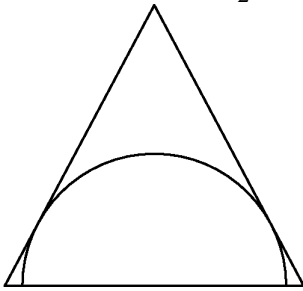
5. What is the correct ordering of the three numbers, 10^8, 5^{12}, and 2^{24}
   (A) $2^{24} < 10^8 < 5^{12}$ (B) $2^{24} < 5^{12} < 10^8$ (C) $5^{12} < 2^{24} < 10^8$ (D) $10^8 < 5^{12} < 2^{24}$
   (E) $10^8 < 2^{24} < 5^{12}$

6. What is the tens digit of 7^{2011}?
   (A) 0 (B) 1 (C) 3 (D) 4 (E) 7

7. What is the area of the triangle with vertices $A = (1,3)$, $B = (5,1)$ and $C = (4,4)$?
   (A) 5 (B) $3\sqrt{2}$ (C) $\frac{4}{3}\sqrt{2}$ (D) $3\sqrt{3}$ (E) 6

8. How many different real numbers satisfy the equation $(x^2 - 5)^2 = 16$?
   (A) 0 (B) 1 (C) 2 (D) 4 (E) 8

9. Ann has 24 markers. In how many ways can she share them with Bob and Chris so that each of the three has at least two markers?
   (A) 105 (B) 114 (C) 190 (D) 210 (E) 380

10. Ralph went to the store and bought 12 pairs of socks for a total of $24. Some of the socks he bought cost $1 a pair, some of the socks he bought cost $3 a pair, and some of the socks he bought cost $4 a pair. If he bought at least one pair of each type, how many pairs of $1 socks did Ralph buy?
    (A) 4 (B) 5 (C) 6 (D) 7 (E) 8

Answer Key:

1. (B) $\frac{56}{225}$

2. (B) 146

3. (B) $120°$

4. (E) $\frac{120}{17}$

5. (A) $2^{24} < 10^8 < 5^{12}$

6. (D) 4

7. (A) 5

8. (D) 4

9. (C) 190

10. (D) 7