1. Annie and Bonnie are running laps around a 400-meter oval track. They started together, but Annie has pulled ahead, because she runs 25% faster than Bonnie. How many laps will Annie have run when she first passes Bonnie?

2. An ATM password at Fred's Bank is composed of four digits from 0 to 9, with repeated digits allowable. If no password may begin with the sequence $9, 1, 1$, then how many passwords are possible?

3. In an All-Area track meet, 216 sprinters enter a $100-$meter dash competition. The track has 6 lanes, so only 6 sprinters can compete at a time. At the end of each race, the five non-winners are eliminated, and the winner will compete again in a later race. How many races are needed to determine the champion sprinter?

4. The sum of 25 consecutive even integers is $10,000$. What is the largest of these 25 consecutive integers?

5. The least common multiple of a and b is 12, and the least common multiple of b and c is 15. What is the least possible value of the least common multiple of a and c?

6. A box contains 3 red chips and 2 green chips. Chips are drawn randomly, one at a time without replacement, until all 3 of the reds are drawn or until both green chips are drawn. What is the probability that the 3 reds are drawn?

7. Rectangle $DEFA$ below is a 3×4 rectangle with $DC = CB = BA$. What is the area of the "bat wings" (shaded area)?
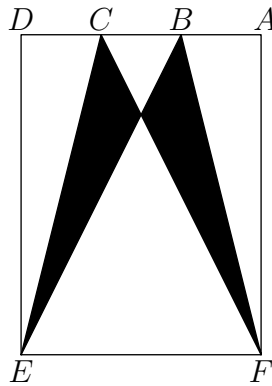
8. Two congruent circles centered at points A and B each pass through the other circle's center. The line containing both A and B is extended to intersect the circles at points C and D. The circles intersect at two points, one of which is E. What is the degree measure of $\angle CED$?

9. The digits 1, 2, 3, 4, and 5 are each used once to write a five-digit number $PQRST$. The three-digit number PQR is divisible by 4, the three-digit number QRS is divisible by 5, and the three-digit number RST is divisible by 3. What is P?

10. 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?
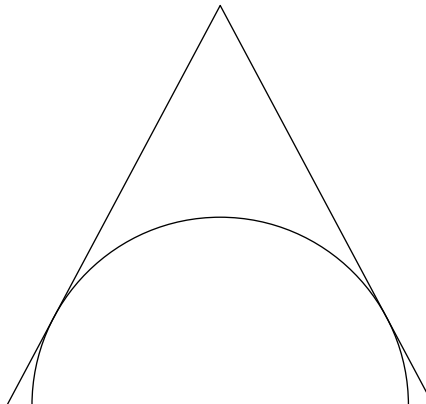
11. If $\dfrac{2+4+6}{1+3+5} - \dfrac{1+3+5}{2+4+6} = \dfrac{m}{n}$ for relatively prime integers m and n, compute $100m + n$.

12. A jar contains 4 blue marbles, 3 green marbles, and 5 red marbles. If Helen reaches in the jar and selects a marble at random, then the probability that she selects a red marble can be expressed as $\frac{m}{n}$, where m and n are relatively prime positive integers. Find $m + n$.

13. Find the least positive integer k so that $k + 25973$ is a palindrome (a number which reads the same forward and backwards).

14. The number 777777 has a factors, and the number 7777 has b factors. What is $|a - b|$?

15. In the following diagram two sides of a square are tangent to a circle with diameter 8. One corner of the square lies on the circle. There are positive integers m and n so that the area of the square is $m + \sqrt{n}$. Find $m + n$.
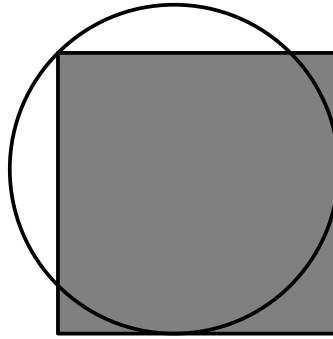
16. The taxi fare in Gotham City is $\$2.40$ for the first $\frac{1}{2}$ mile and additional mileage charged at the rate $\$0.20$ for each additional 0.1 mile. You plan to give the driver a $\$2$ tip. How many miles can you ride for $\$10$? Express your answer as a decimal to the nearest tenth.

17. What is the sum of the reciprocals of the roots of the equation

$$\frac{2003}{2004}x + 1 + \frac{1}{x} = 0?$$

18. What is the tens digit of $7^{9^{2016}}$?

19. What is the maximum number of regions one circle and one triangle can split the plane into?

20. David drives from his home to the airport to catch a flight. He drives 35 miles in the first hour, but realizes that he will be 1 hour late if he continues at this speed. He increases his speed by 15 miles per hour for the rest of the way to the airport and arrives 30 minutes early. How many miles is the airport from his home?

21. Suppose that a cows give b gallons of milk in c days. At this rate, how many gallons of milk will d cows give in e days? (Express your answer as a fraction in terms of a, b, c, d, e.)

22. Five friends go to a movie and sit in 5 consecutive seats. If two of the friends, Larry and Jack, can't sit next to each other (or else they will just mess around the whole time), in how many orders can the friends sit down?

23. Rabbits Peter and Pauline have three offspring - Flopsie, Mopsie, and Cotton-tail. These five rabbits are to be distributed to four different pet stores so that no store gets both a parent and a child. It is not required that every store gets a rabbit. In how many different ways can this be done?

24. Find the product of all of the positive integers n that satisfy the following inequality.

$$n < 12 < n + 17 < 2n + 10 < n^2 - 51$$

25. Let $\#(x) = 4x + 7$. What is the remainder when $\#(1) + \#(2) + \#(3) + \cdots + \#(2015) + \#(2016)$ is divided by 13?