1. **(2 points)** Alex loves doing math, but for some reason he can't solve the problem seen below:

   Simplify this expression using the order of operations:

   $$43 - (3 \times 6) + \left(\left(\frac{9}{3}\right) + 4\left(\frac{1}{1+1}\right)\right)$$

   Help Alex out. What is the answer to his problem?

2. **(2 points)** Mr. Rios, the French teacher, can say 316 French words in a minute. Govind and Ryan can say 216 and 228 words in a minute, respectively. How many French words can the three of them say as a team in 5 minutes?

3. **(2 points)** Phalguna, who is a poor boy, has two \$20 dollar bills, seven \$5 dollar bills, six quarters, three nickels, three dimes, and 36 pennies. How much money does he have in dollars?

4. **(2 points)** Govind has lots of clothes. If he has 14 shirts, 8 pairs of pants, and 4 pairs of shoes. An outfit must have a shirt, a pair of pants, and a pair of shoes. How many different outfits can Govind make?

5. **(3 points)** Ryan runs really fast. His goal is to run as fast as Sonic the Hedgehog, who can run 1 mile in 39.06 seconds. Right now, Ryan can run 1 mile in 56.36 seconds. If Ryan gets 0.05 seconds faster with every mile that he runs during training, how many miles must Ryan run during training to run as fast as Sonic?

6. **(3 points)** 290 Rickards students were sent on a field trip to the AMC theater. 165 students saw Planes, 108 saw Thor, and 54 saw both movies. How many kids didn't see either movie?

7. **(3 points)** Roger Federer is the greatest tennis player ever. Period. He has a 75% chance of getting his first serve in, and a 84% chance of winning a point off of his first serve. He plays a game in the U.S. Open Finals against Novak Djokovic, clobbering him and serving 100 times. How many points does he win off of his first serves?

8. **(3 points)** I like to wear jeans. I have 7 jeans, labeled A, B, C, D, E, F, and G. I wear one pair each day of the week, and in that order. If I start with A on the first day of the year, which jeans will I be wearing on the 119^{th} day of the year?

9. **(4 points)** Mr. Fraser decided to test a sample of students in his Calculus BC class that contained 10 students. In the class, 6 of them really knew calculus, 3 somewhat knew calculus, and 1 knew no calculus. Let

   A = the probability that Mr. Fraser picks a student who only somewhat knew calculus, if he chooses one student at random

   B = the probability that Mr. Fraser picks a student who knew at least some calculus, if he chooses one student at random

   Find $\frac{A}{B}$.

10. **(4 points)** Let

    A = the angle of a triangle where the other two angles are 36° and 57°
    B = the number of composite integers between 25 and 48 (not including 25 and 48)
    C = the number of sides in a dodecagon
    D = the surface area of a cylinder (the formula for this is $2\pi r^2 + 2\pi rh$, where r is the radius and h is the height), where the radius is 5 and the height is 4 (assume $\pi = 3.1$)

    Evaluate $(A + D) - (B + C)$.

11. **(4 points)** Find the volume of a triangular prism, where the base is a right triangle where the legs have lengths of 5 and 8, and the height is 9 (the volume of a triangular prism is equal to the area of the base times the height).

12. **(4 points)** Govind was told to write this test at 8:23 PM, the night the test was due. He also needs to make 4 sandwiches, do his history homework, chemistry lab report, and English essay. If it takes 1 hour and 43 minutes to write this test, 4 minutes to make 1 sandwich, 23 minutes to do his history homework, 36 minutes to do his lab report, and 45 minutes to do his English essay, will he finish everything by 12:00 AM? If not, how many minutes past 12:00 AM does he work?

13. **(5 points)** Pamela loves to grow plants. One day she bought 3 plants of varying growths and starting heights. The first plant starts out at 12 inches, and grows 2 inches per week. The second plant starts out at 7 inches and grows at 3 inches per week. The third plant starts out at 2 inches and grows at 4 inches per week. How many weeks does it take for the plants to be the same height?

14. **(5 points)** The girls at JSRHS are in love with the band One Direction (as are most of the boys). There are 28 girls at JSRHS. 25% of the girls listen to the entire album 9 times a day, 50% of the girls listen to the entire album 2 times a day, and the rest of the girls listen to the entire album 6 times a day. How many times is the One Direction album listened to at JSRHS over the course of 2 weeks?

15. **(5 points)** Mihir can serve a tennis ball pretty fast. Out of 5 tries, Mihir serves 109 mph, 121 mph, 117 mph, 96 mph, and 136 mph. John Isner serves 5 times and serves 154 mph, 81 mph, 115 mph, 98 mph, and 120 mph. Who has the faster average serve?