Math 5b, homework 5.

1. Without doing calculation prove that

   a. $\frac{1}{3}+\frac{1}{4}>\frac{1}{2}$;

   b. $\frac{1}{5}+\frac{1}{6}+\frac{1}{7}+\frac{1}{8}>\frac{1}{2}$

2. * Prove that if the sum of the first and last digits of a three-digit number is equal to the second digit, the number is divisible by 11.

   (If $\overline{abc}$ is a three digit number, a,b,c are digits, and $a+c=b$, the number $\overline{abc}$ is divisible by 11. For example, numbber 352 is divisible by 11, $352:11=32$, $3+2=5$) Hint: whrite the number in the extended form. We will dicuss this problem in class.

3. Three friends, Ashton, Boris, and John live in three houses. There are three roads between Ashton's house and Boris's house, and two roads between John's houses. How many possible ways are there for Ashton to go to visit John?

4. Ashton got a summer assignment to read seven books. In how many different orders is it possible to read all these books?

5. Do the mental math, write only answers. Check, how fast you are.

   $1.67+0.3$; $7.96-0.6$; $1.25\cdot 8$; $0.9\cdot 7$; $43.7:10$;
   $15.6\cdot 0.1$; $2.84\cdot 10$; $15.3:3$; $0.24:0.8$; $1.56:0.01$

6. Solve the equations:
   a. $13x-5x=16.4$ b. $10.5\cdot(4.2+x)=63$

   c. $\dfrac{\frac{7}{12}}{0.14}=\dfrac{50x}{4.8}$;   d. $\dfrac{1\frac{3}{17}}{13.75}=\dfrac{2\frac{2}{11}}{3x}$

7. Simplify:

   a. $(4c^2\cdot c^3)^3$;   b. $((x^2y)^3)^4$;   c; $\left(\dfrac{9a^7b^5}{45a^3b}\right)^4$

8. An apple cost 9 cents, and an orange 15 cents. Elena bought some apples and oranges, 20 fruit in all, and paid $2.64. How many apples and how many oranges did she buy?