Math 310 - Dr. Miller - Exam #1 - 2/16/09

Set all cell phones to off or silent - no vibrating.

1. *[8 pts]* Explain why the fraction $\frac{5}{0}$ makes no sense, referring to one of the "part-of" meanings of a fraction. (1 or 2 sentences)

2. *[12 pts]* If 2 orange Fraction Tiles represent the fraction $\frac{8}{3}$, how could you represent the fraction $\frac{1}{2}$? Clearly explain your reasoning.

3. *[10 pts]* Find a fraction that is equivalent to $\frac{15}{8}$, and for which the sum of numerator and denominator is 368. Show scratch work, but you need not explain.

4. Consider the fractions $\frac{30}{41}$ and $\frac{3}{4}$.

   (a) *[10 pts]* Demonstrate two different techniques for determining which of these fractions is larger.

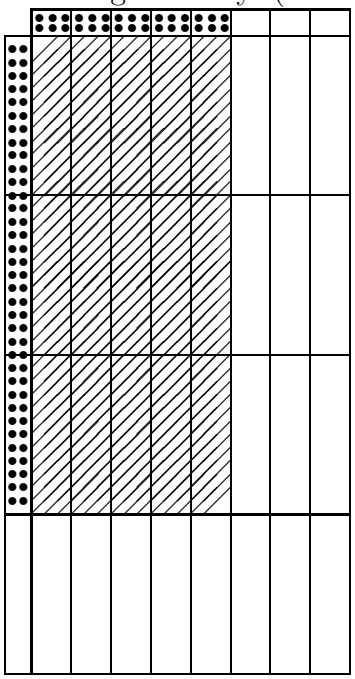
   (b) *[4 pts]* Demonstrate any technique for finding a fraction between these two.

5. *[6 pts]* Explain why a common denominator is necessary for adding and subtracting fractions. (1 or 2 sentences)

6. *[8 pts]* Subtract entirely in mixed number notation: $7\frac{1}{3} - 2\frac{3}{4}$. Show clear work.

7. *[6 pts]* Write the number of one problem among Problems #1-6 on this exam in which you used the Fundamental Law of Fractions. Then write and circle the initials "FLF" next to where you applied it **in that problem**.

8. *[8 pts]* Daphne drew the following diagram to compute $\frac{5}{8} \times \frac{3}{2}$. She claims that her picture shows that the denominator of the product should be 32. Explain whether she is right or wrong and why. (1 or 2 sentences)



9. Consider the computation $15 \div 3\frac{1}{2}$.

   (a) *[6 pts]* Explain how estimation could help a child to know whether this quotient is larger or smaller than 5. Do **not** actually compute the quotient. (1 or 2 sentences)

   (b) *[10 pts]* Now draw a diagram representing this computation. Circle your final answer, and explain *only* how the "left-over" is interpreted. (1 sentence)

10. *[12 pts - 4 each]* Correctly spell the name of the property best indicated by each number sentence below.

   (a) $\left(\frac{1}{3}+\frac{3}{4}\right)+\left(0+\frac{1}{2}\right)=\left(\frac{1}{3}+\frac{3}{4}\right)+\frac{1}{2}$

   (b) $\left(\frac{1}{3}+\frac{3}{4}\right)+\left(0+\frac{1}{2}\right)=\left(\frac{3}{4}+\frac{1}{3}\right)+\left(0+\frac{1}{2}\right)$

   (c) $\left(\frac{1}{3}+\frac{3}{4}\right)+\left(0+\frac{1}{2}\right)=\left(\frac{1}{3}+\frac{3}{4}\right)+\left(0\cdot\frac{2}{5}+\frac{1}{2}\right)$