

Fractions Revisited

AIM Math Teachers' Circle

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1. *Fractions Quick Concept Quiz* (Thanks to Jason Dyer's "The Number Warrior" blog)
 - i. Why can every fraction be represented an infinite number of ways?
 - ii. How do you simplify a fraction? This procedure is often called "reducing" – why is this a good name? Why is this a bad name?
 - iii. When is simplifying fractions important? When is it not important?
 - iv. Why do the denominators need to be the same when adding (or subtracting) fractions?
 - v. Why do the denominators **not** need to be the same when multiplying two fractions?
 - vi. Why is $\frac{2}{3} + \frac{5}{3} = \frac{7}{6}$ wrong and $\frac{2}{3} \times \frac{5}{3} = \frac{10}{9}$ right?
 - vii. Why is dividing by $\frac{1}{2}$ the same as multiplying by 2?
 - viii. How can common denominators help in dividing fractions?

2. *Smallest Sum* (From Sam Vandervelde)

Using the four numbers 96, 97, 98, and 99, build two fractions whose sum is as small as possible. As an example, you might try $\frac{99}{96} + \frac{97}{98}$ but that is not the smallest sum.

3. *Simpsons* (with thanks to <http://www.cut-the-knot.com>)
 - i. Lisa's lemonade stand sells 20 cups of lemonade for 30 cents each and 80 cookies for 50 cents each. What is the average price per item?
 - ii. Bart's lemonade stand sells 80 cups of lemonade for 40 cents each and 20 cookies for 60 cents each. What is the average price per item?
 - iii. Whose lemonade stand has the lower prices? Per item? Per cup? Per cookie?

4. *More Simpsons*
 - i. In their first basketball practice, Bart makes 5 out of 11 free throws while Lisa makes 3 out of 7. Who is the better free throw shooter?
 - ii. In their second basketball practice, Bart makes 6 out of 9 free throws while Lisa makes 9 out of 14. Who is the better free throw shooter?
 - iii. Who is the better free throw shooter?

5. *In the Space Between*
 - i. Name a fraction between $\frac{11}{15}$ and $\frac{7}{10}$.
 - ii. Name the fraction with smallest denominator between $\frac{11}{15}$ and $\frac{7}{10}$.
 - iii. (Adapted from davidbau.com, which in turn adapted it from Gelfand and Shen *Algebra*)
First you draw red marks to divide a long straight board into 7 equal pieces. Then you draw green marks to divide the same board into 13 equal pieces. Finally you decide to cut the board into $7+13 = 20$ equal pieces. How many marks are on each piece?