

Instruction matters!

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Homework

A newsletter for middle school math teachers addressing best practices

Homework Assignments

Homework assignments should reflect and reinforce learning objectives. Classroom teachers assume that their students will not only complete their daily homework assignment, but believe students will also study. That's a bad assumption. Most students see homework as something that needs to be completed. Asked what they do after their last homework problem has been completed, the great majority of students will answer they close the book and move on to the next subject.

Homework should encourage studying; most homework assignments don't. Studying includes reading, thinking, reflecting, organizing, writing, analyzing, visualizing, reviewing, remembering, and recalling.

A typical secondary math assignment in the United States looks like this:

Page 165, 1 – 30 odd

A more appropriate homework assignment that would encourage studying would look more like this:

Read Sec 4.2 Add/Subtract Fractions

Define Fraction

Write the procedure for add/sub fractions

Draw a model to represent adding fractions

Explain the relationship between the algorithms for adding fraction and decimals

Page 165, 1-30, multiples of 3

N.B. - fewer exercises assigned.

That homework assignment includes components that encourage and reflect studying.

Knowing standard algorithms is important in learning math. On subsequent nights' homework, students might be asked to write the procedure for adding fractions again. Other questions might also be included in subsequent assignments, such as, why aren't denominators added when adding fractions.

The good news about including these types of questions is that teachers answer them in their instruction, and therefore the answers should be in student notebooks. Students would have a tough time telling a teacher the reason they did not do their homework was because they did not understand since all they had to do for most of it was revisit their notes. And, if the students did answer those questions, there would be a much higher probability that they would be able to complete the practice exercises.

Semester Exams

You can find copies of the Pre-Algebra and Algebra practice semester exams on www.rpd.net. Along with those practice exams, you can also find 10 problems per specification.

The practice tests and real exams are parallel constructed. That is, if question three involves add/sub fractions on the practice, then question 3 on the real test would be an add or subtract problem. Also, if question 17 is on the bottom of the third page on the practice test, then question 17 will be located in the same position on the real exam.

www.hanlonmath.com

The Hanlonmath website contains content, strategies and resources that you can easily download for use in your classroom - free.

Finding a Common Denominator

There are a number of ways of finding a common denominator. The method you choose can make adding/subtracting fractions with unlike denominators a breeze or problematic. The most common methods used in classrooms are finding the LCM (prime factorization), multiplying the denominators, and writing multiples of each denominator. A fourth method is often referred to as the **Reducing Method**.

I personally like to use one of two methods to find a common denominator depending upon the denominators. If the denominators are relatively prime, I find the best way to find a common denominator is by multiplying the denominators together.

Example: $3/5 + 1/4$, multiplying the denominators $5 \times 4 = 20$, the CD is 20.

If the denominators are not relatively prime, I like to use the Reducing Method. To use the Reducing Method, you write a fraction by using the two denominators.

Example: $5/18 + 7/24$, make a fraction using the two denominators $\rightarrow 18/24$

Reduce $\frac{18}{24} = \frac{3}{4}$ Cross multiply, $18 \times 4 = 24 \times 3 = 72$.

The common denominator is 72. This follows directly from finding the LCM.

What's nice about this method is that students only have to look at the reduced denominators to determine what number to multiply the original fractions by to make equivalent fractions.

$$\frac{5}{18} = \frac{\quad}{72} \quad \text{Note } 18 \times 4 = 72$$

$$+ \frac{7}{24} = \frac{\quad}{72} \quad \text{Note } 24 \times 3 = 72$$
