

Lesson: Adding & Subtracting Fractions

Title: Adding and Subtracting Fractions

Objectives:

Students will learn a method to help them add and subtract fractions.

Materials:

Teacher notes and script (*This page and next*)

Student note sheet and practice problems (*Make a copy for each student*)

Student worksheet (*Make a copy for each student.*)

Overheads (*Make transparencies*)

Previous Knowledge Needed:

Reducing fractions

Important Concepts/Methods:

There are two ways to add or subtract fractions.

Method 1 – Find a common denominator. Change your fractions into equivalent fractions using that denominator. Add or subtract your new fractions then reduce the answer down.

Method 2 – Multiply using the following pattern, putting numbers into the locations shown and reduce down the answer.

$\frac{5}{6} + \frac{3}{4}$	5	6	
3	3 x 5 = 15	3 x 6 = 18	→ $\frac{20 + 18}{24} = \frac{38}{24} = \frac{19}{12}$
4	4 x 5 = 20	4 x 6 = 24	

Script:

There are two ways to think about adding and subtracting fractions. We'll do the problems both ways, and then you can decide how you want to do them. Let's read the first problem. (*Put up overhead and read the problem.*)

$$\frac{3}{5} + \frac{1}{3}$$

- a) $\frac{1}{2}$
- b) $\frac{4}{15}$
- c) $\frac{14}{15}$
- d) $\frac{1}{5}$

We'll try this problem with the first method. Method 1 says to get common denominators. You need to find a number that both 5 and 3 go into. What number do 5 and 3 go into? (*Get the students to come up with 15.*) So 15 is our common denominator. Now we're going to rewrite our fractions with our common denominators. So first we need to change three fifths to something over 15. What do you multiply 5 by to get 15? (*Get students to say 3.*) So we multiply the numerator by three also. 3 times 3 is 9. (*Write $\frac{3}{5} = \frac{9}{15}$ and have students do the*

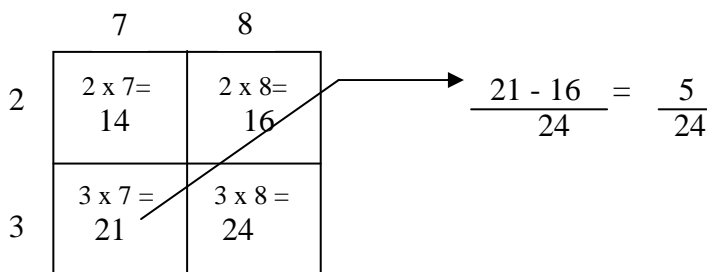
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same on their papers.) Now we need to do the same to one third. What do we multiply 3 by to get 15? (Get students to say 5.) So one times 5 is five. (Write $\frac{1}{3} = \frac{5}{15}$ and have students do the same.) That means that problem is now nine fifteenths plus five fifteenths. (Write $\frac{9}{15} + \frac{5}{15}$ and have students do the same.) Add the numerators 9 plus 5 is 14, and the denominator stays 15. (Write $\frac{14}{15}$ and have students do the same.) Since this problem doesn't reduce, we're finished. Any questions? (Answer any questions that the students have.)

Let's try the next problem with the second method. (Put overhead up and read.)

$$\frac{7}{8} - \frac{2}{3}$$

- a) $\frac{7}{12}$
- b) 1
- c) $\frac{5}{11}$
- d) $\frac{5}{24}$



(Draw the box with 4 squares. Write the 7 and 8 over top boxes and the 2 and 3 on the left hand side. Then have students multiply the # above and to the side and fill in each box. Have students do the same on their papers.) The problem is subtraction so we put subtraction in the problem. (Place the numbers into the problem, then write $\frac{21-16}{24}$. Have students do the same on their papers.) Now we just simplify it down. 21 minus 16 is

5. So we have five twenty fourths. (Write $\frac{5}{24}$. Have students do the same on their papers.) Since this doesn't reduce, we're finished. Any questions? (Answer any questions that the students have.)

Common Mistakes:

In the first problem they got a by adding the numerators and denominators. 3 plus 1 is 4 and 5 plus 3 is 8, so we get $\frac{4}{8}$ which reduces down to $\frac{1}{2}$. To get answer b they added the numerators and multiplied the denominators. And to get answer d they multiplied the numerators and denominators to get $\frac{3}{15}$ which reduces down to $\frac{1}{5}$.

The second problem has the same types of mistakes. They got a by multiplying across 7 times 2 is 14 and 8 times three is 24. $\frac{14}{24}$ reduces to $\frac{7}{12}$. Answer b was found by subtracting both the numerator and denominator. 7 minus 2 is 5 and 8 minus 3 is 5. $\frac{5}{5}$ reduces down to one. Answer c was gotten by subtracting the numerators and adding the denominators.

Student Problems:

Try the next two problems on your own. (Give students time to try the problems.) (Put overhead up and either work out problems or give students the opportunity to come up and explain them. Make sure they do all steps.)

Assignment:

(Hand out assignment sheet. Either give students time to do and then discuss their problems, or give as homework and collect the next day.)

1) $\frac{3}{5} + \frac{1}{3}$

a) $\frac{1}{2}$

b) $\frac{4}{15}$

c) $\frac{14}{15}$

d) $\frac{1}{5}$

2) $\frac{2}{11} + \frac{1}{7}$

a) $\frac{1}{6}$

b) $\frac{25}{77}$

c) $\frac{3}{77}$

d) $\frac{1}{9}$

3) $\frac{7}{8} - \frac{2}{3}$

a) $\frac{7}{12}$

b) **1**

c) $\frac{5}{11}$

d) $\frac{5}{24}$

4) $\frac{11}{12} - \frac{3}{4}$

a) $\frac{1}{6}$

b) $\frac{11}{16}$

c) **1**

d) $\frac{7}{8}$

Let me show what I know!

Roll a pair of dice. Put the number in one of the squares in the problem. Then roll it again and put that number in another square. Keep going until all the squares are filled. Work out the answers when finished. In the first column try to get the biggest answers you can. In the second column, try to get the smallest.

Example: I first rolled two sixes which is 12, then a one and a six to get 7, then a three and a two to get 5, and then two ones to get two. I'm trying to get as small a number as possible, so I put the in the problem as shown.

$$\frac{\begin{matrix} [5] \\ [12] \end{matrix}}{\begin{matrix} [] \\ [] \end{matrix}} + \frac{\begin{matrix} [2] \\ [7] \end{matrix}}{\begin{matrix} [] \\ [] \end{matrix}} = \text{Working out the answer gives me } 59/84.$$

Big as possible 3 2 4 1

$$\frac{\begin{matrix} [] \\ [] \end{matrix}}{\begin{matrix} [] \\ [] \end{matrix}} + \frac{\begin{matrix} [] \\ [] \end{matrix}}{\begin{matrix} [] \\ [] \end{matrix}} =$$

5 6 3 2

$$\frac{\begin{matrix} [] \\ [] \end{matrix}}{\begin{matrix} [] \\ [] \end{matrix}} + \frac{\begin{matrix} [] \\ [] \end{matrix}}{\begin{matrix} [] \\ [] \end{matrix}} =$$

8 1 4 3

$$\frac{\begin{matrix} [] \\ [] \end{matrix}}{\begin{matrix} [] \\ [] \end{matrix}} + \frac{\begin{matrix} [] \\ [] \end{matrix}}{\begin{matrix} [] \\ [] \end{matrix}} =$$

6 7 2 4

$$\frac{\begin{matrix} [] \\ [] \end{matrix}}{\begin{matrix} [] \\ [] \end{matrix}} + \frac{\begin{matrix} [] \\ [] \end{matrix}}{\begin{matrix} [] \\ [] \end{matrix}} =$$

Small as possible 3 2 4 1

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6 7 2

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Ideas that I'm going to study and learn.

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a) $\frac{7}{12}$

b) 1

c) $\frac{5}{11}$

d) $\frac{5}{24}$

3) $\frac{2}{11} + \frac{1}{7}$

a) $\frac{1}{6}$

b) $\frac{25}{77}$

c) $\frac{3}{77}$

d) $\frac{1}{9}$

4) $\frac{11}{12} - \frac{3}{4}$

a) $\frac{1}{6}$

b) $\frac{11}{16}$

c) 1

d) $\frac{7}{8}$