

7. Explanation: If you add the denominators (of two Like Fractions) you double the number of pieces needed to make a whole. You are not being consistent.

Note: Consider why such mathematics would be inconsistent:

Say there is one pie divided into 10 equal pieces. $2/10 + 3/10$, would then incorrectly equal $5/20$. Thus adding the denominators would incorrectly give $1/4$ of the pie as opposed to $1/2$ of the pie.

Now consider two pies, each divided into 10 equal pieces. If 2 pieces are taken from one pie ($2/10$) and 3 pieces are taken from the other pie ($3/10$) the incorrect result would correctly express the answer that 5 out of 20 pieces have been taken. This would correctly represent the fact that $1/4$ of the two pies have been taken. But this alters the definition of a whole from one pie to two pies. (See question 8 for a more explicit example of this.)

8. Explanation: The left hand side shows two wholes each divided into four equal pieces. The right side shows one whole equal to the original two wholes divided into eight equal pieces. Therefore the same whole or unit is not defined on each side of the equation.

Note: For example, if a rectangle, 16 inches long is cut into four, 4 inch pieces, you cannot now say, 8 of these same 4 inch pieces make the same rectangle.

This does not mean it isn't possible to take the original 4 pieces and cut each into 2 pieces for a total of 8 pieces. These eight pieces would still represent the same whole. The difference is that these 8 pieces are each half the size of the original 4 pieces. This is simply a visual way of showing equivalent fractions: $1/4 = 2/8$. (Also see note for question 7.)

9. Answer: No.

9. Explanation: The two halves are not referenced to the same size unit.

Note: "One what?," would be a better question. It's like saying one-half of a quart + one-half of a gallon. The units are not consistent if the size of the two objects are different.

10a. Answer: No.

10a. Explanation: It is clear that $A+B$ represent more than $1/3$ of the pie.

10b. Answer: $1/3$.