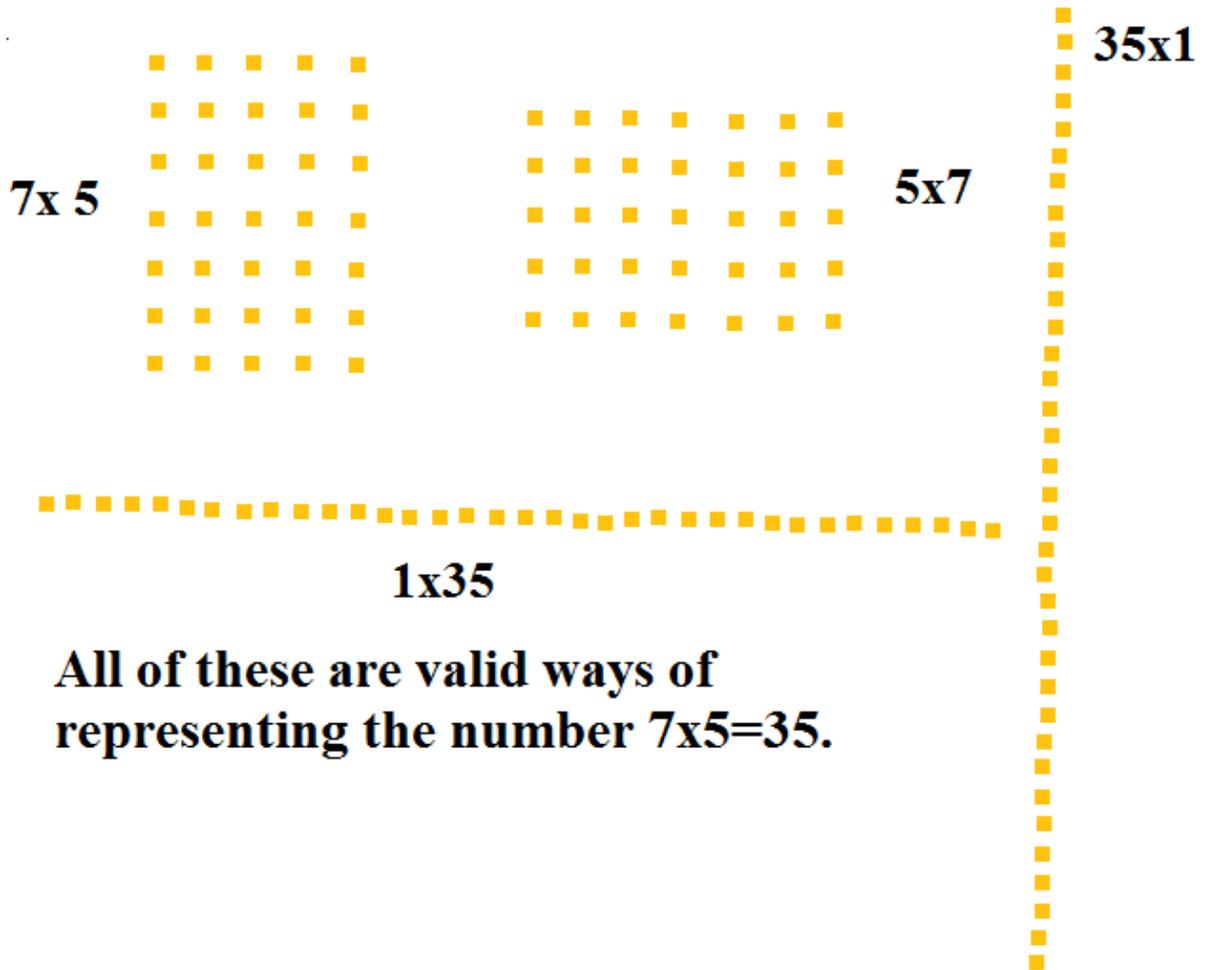


Grade 3 Operations and Algebraic Thinking – SAMPLE SOLUTIONS

(Adaptive from Illustrative Mathematics.org and the Common Core document –these are just one of many valid solution methods)

1. Draw a picture to represent 5×7 (Common Core document)

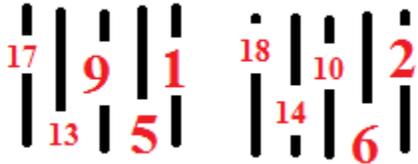


All of these are valid ways of representing the number $7 \times 5 = 35$.

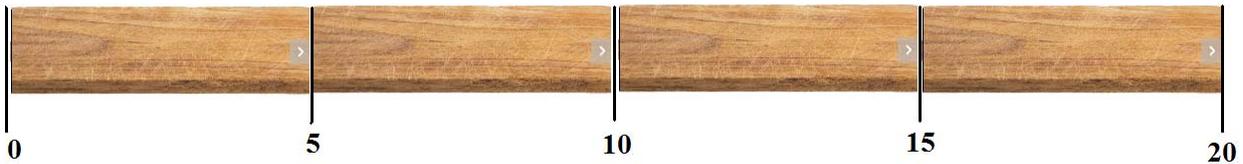
2. Which of the following expressions represent 42 marbles are divided equally by 7 children?
 - a. $42 + 7$ This is 42 marbles and 7 marbles to one child – now how many?
 - b. $42 \div 7$ **THIS ONE!**
 - c. 42×7 This is 42 Marbles to each of 7 children – now many in all?
 - d. $42 - 7$ This is 42 marbles then take back 7 marbles to one child – now how many?

3. If Scott cuts a 20 foot piece of wood into 4 equal pieces to make a book shelf, how long would each piece be? Show your work

Imagine 20 1 foot pieces of wood – like 20 rulers. We deal them to 4 piles as shown where the number 4 for example indicates where the 4th ruler went in the dealing.

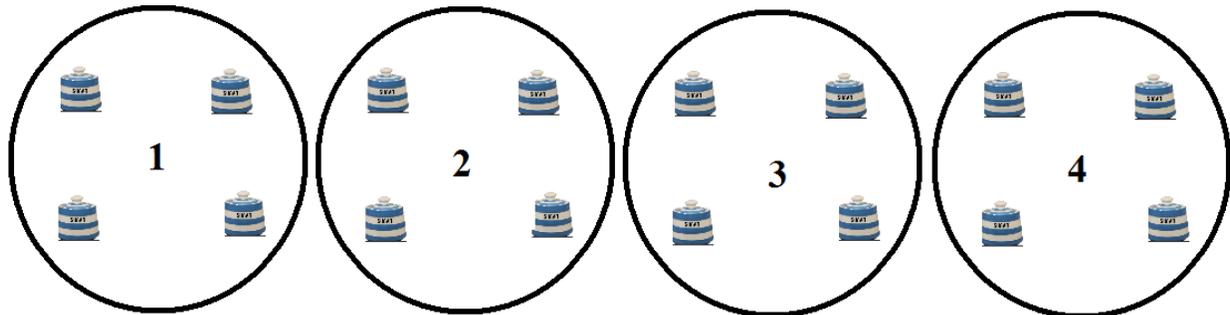


So each piece gets 5 feet of board. This tells us how to cut one long board as shown below.



4. If Zack has a 16 ounces of Sugar and he wants to make a pie that requires 4 ounces of sugar, how many pies can he make? Show your work

With each little bowl being 1 ounce of sugar we see below that 4 pies can be made:



Solve the following problems

5. $10 = \underline{\quad} \div 3$

The answer is 10×3 or $10 + 10 + 10 = 30$.

6. $7 \times 6 = 7 + 7 + 7 + 7 + 7 + 7 = 14 + 14 + 14 = 28 + 14 = 42$

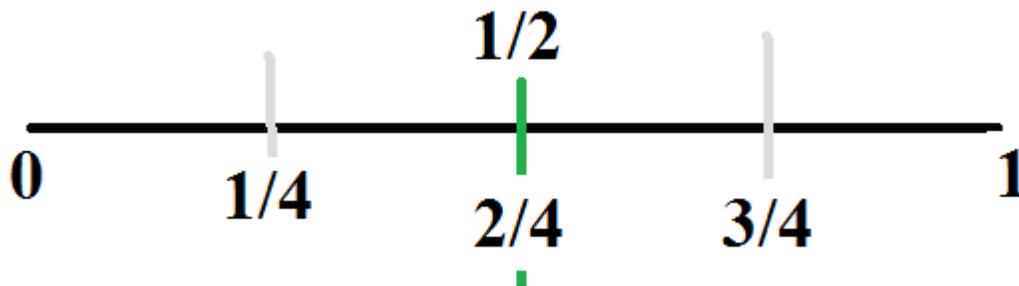
True or False Explain your thinking

7. $3 \times 6 = 6 \times 3$ *TRUE* by commutativity of multiplication.

8. $8 \times 4 = 8 + 4 + 8 + 4$ *FALSE* as $8 \times 4 = 8 + 8 + 8 + 8$ (adding 4 instead of 8 two times will give less)

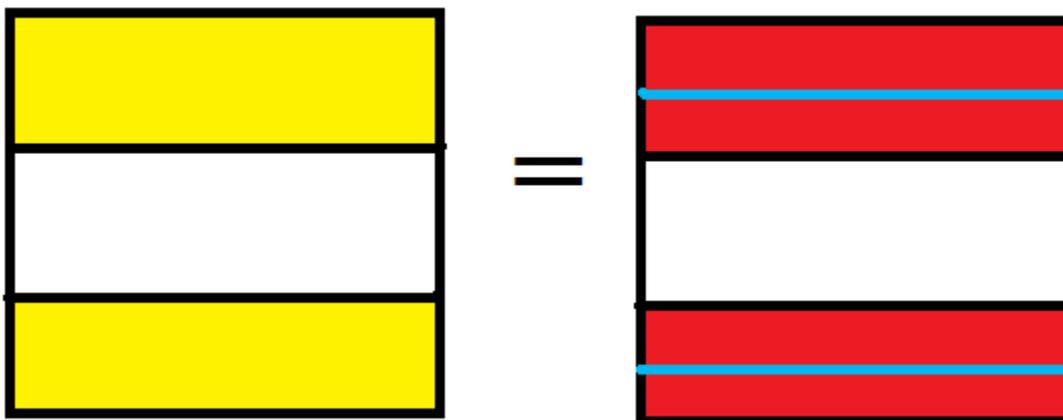
9. $9 \times 4 = 9 + 9 + 9 + 9$ *TRUE* by expressing multiplication as repeated addition.

10. Create a number line to show that $\frac{2}{4}$ is equal to $\frac{1}{2}$



11. Draw a picture (visual model) to show $\frac{4}{6} = \frac{2}{3}$

You can get $\frac{4}{6}$ from $\frac{2}{3}$ by multiplying the numerator and denominator by 2. Thus as the diagram shows if you divide each of the thirds into two pieces you get four 6ths as required.

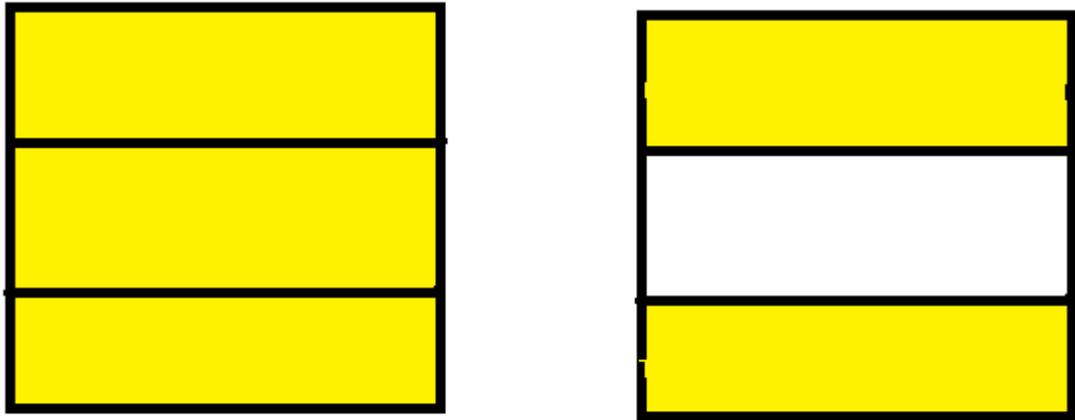


Which one is bigger? Explain your thinking

12. $\frac{4}{8}$ or $\frac{5}{8}$ *The denominators are the same and $5 > 4$ so $\frac{5}{8} > \frac{4}{8}$*

13. $\frac{3}{4}$ or $\frac{2}{4}$ *The denominators are the same and $3 > 2$ so $\frac{3}{4} > \frac{2}{4}$*

14. Draw a picture to represent the following fraction $\frac{5}{3}$



$$\frac{5}{3} = 1 \frac{2}{3}$$