

Math 246 Review 2:

1. Draw a bar diagram to show how to solve each of the following word problems, and write the associated equations:

- Addition and subtraction bar diagrams need labels
- Multiplicative comparison bar diagrams need labels
- Other multiplication and division bar diagrams do not need labels
- Each bar diagram needs an addition or multiplication equation (which may be a missing part equation)
- Some bar diagrams should also have a subtraction or division equation.

- Sandra had 4 erasers left after she gave 7 erasers to her friends. How many erasers did she start with?
- Marie has 8 blue balloons and 5 red balloons. How many more red balloons than blue balloons does she have?
- Kyle has 9 transformers. He has 3 more than his sister. How many does his sister have?
- Amanda has 6 origami cranes. How many more does she need to make to have 10 origami cranes?
- Paul had 14 cookies. He gave some to his brother, and now he has 8. How many cookies did he give to his brother?
- A tootsie roll costs 4¢. Ross has 24¢. How many tootsie rolls can he buy?
- A toy train can go 20 feet in 5 seconds. How many feet can it go in one second?
- A Jar of jam has 8 ounces of jam in it. How many ounces of jam are in 5 jars?
- John has 4 pencils. Nathan has 5 times as many pencils as John. How many pencils does Nathan have?
- Kyle has 24 crayons. He has 3 times as many crayons as Clara. How many crayons does Clara have?

2. Show **two ways** of doing each calculation that are **different from the standard algorithm**. Know how to show at least one strategy for each on an open number line.

- a. $36 + 29$ c. $92 - 38$

3. Explain (using appropriate base 10 language) the following two steps in the standard subtraction algorithm:

$$\begin{array}{r} 628 \\ - 293 \\ \hline 5 \end{array} \Rightarrow \begin{array}{r} 512 \\ \cancel{6} \cancel{2} 8 \\ - 293 \\ \hline 5 \end{array} \Rightarrow \begin{array}{r} 512 \\ \cancel{6} \cancel{2} 8 \\ - 293 \\ \hline 35 \end{array}$$

4. Show how to solve each of these using the appropriate expanded algorithm:

- a. $478 + 394$ b. $723 - 186$ c. 246×87

5. Show how to solve the following problem using scaffolding division in a way that uses easier multiplication facts than the most efficient solution:

$8081 \div 12$

6. a. Explain how knowing the commutative law of multiplication helps children learn the multiplication facts

- b. Draw a diagram and write an (in words) explanation that shows why the commutative law of multiplication makes sense (you may show it for a specific example)
7. a. Explain how knowing the distributive law of multiplication over addition helps children learn the multiplication facts
 b. Draw a diagram and write an (in words) explanation that shows why the commutative law of multiplication makes sense (you may show it for a specific example)
8. Write **a.** a partition and **b.** a measurement division word problem for $36 \div 4$.
9. Write a word problem for 32×14
10. Show how to compute 438×49 using the lattice algorithm
11. a. Show how to compute $\begin{array}{r} 548 \\ \times 37 \\ \hline \end{array}$ using the standard algorithm.
 b. Before computing 3×8 in the standard algorithm we write a 0 in the partial product. Explain why we write a 0 there.
 c. When we compute $3 \times 8 = 24$ on the standard algorithm, we write 4 in the tens place, and we write 2 above the tens place. Why does 4 go in the tens place, and why does 2 go above the tens place?
12. a. Sketch an array diagram for: 57×82
 b. Write out the product using the expanded algorithm
 c. Write out the product using the standard algorithm
 d. Color code or label to show how the solutions in a, b, c show where the place value products are in each method.
13. a. Write a division problem with a remainder where the answer that makes sense is the quotient
 b. Write a division problem with a remainder where the answer that makes sense is the quotient+1
14. Analyze and explain an error pattern or an alternate algorithm for addition, subtraction, multiplication or division.
15. Show two ways of figuring out 4×9 using efficient strategies.
16. Show two ways of figuring out 6×7 using efficient strategies.
17. a. Show what a direct modeling type picture (so you could count each object to find the answer) of a partitive division solution for $19 \div 5$ would look like.
 b. Show what a direct modeling type picture (so you could count each object to find the answer) of a measurement division solution for $19 \div 5$ would look like.
18. Solve by long division $4793 \div 13$