

- **Subtracting Across Zeros**
- **Missing Factors**

### Subtracting Across Zeros

- Instead of regrouping one step at a time, we can look at the problem another way.
- Mentally group the hundreds and tens digits as tens. Think: 3 hundreds is 30 tens.
- Then regroup “one” from the “tens.”
- **Regroup** across all zeros in one step:
- Compare:

Regroup one step at a time:

$$\begin{array}{r}
 2,1016 \\
 -\$316 \\
 \hline
 \$278 \\
 \hline
 \$38
 \end{array}$$

Regroup across all places in one step:

$$\begin{array}{r}
 3016 \\
 -\$278 \\
 \hline
 \$38
 \end{array}$$

### Missing Factors

- **Factors** are numbers that are multiplied. The **product** is the answer to a multiplication problem.

$$\text{factor} \times \text{factor} = \text{product}$$

- To find a missing factor, divide.  $7n = 28$   $(7)\overline{28} = 4)$
- Letters that take the place of numbers are called **variables**.
- When a number and variable are written side by side, it means the number and variable are multiplied. So  $3n$  means 3 times  $n$ .

$$\begin{array}{rcl}
 3n & = & 15 \\
 n & = & 5
 \end{array}
 \quad
 \begin{array}{rcl}
 8x & = & 48 \\
 x & = & 6
 \end{array}$$

### Practice:

Subtract. Remember to write the dollar sign in money problems.

1. 
$$\begin{array}{r}
 \$721 \\
 -\$546 \\
 \hline
 \end{array}$$

2. 
$$\begin{array}{r}
 \$2.06 \\
 -\$1.67 \\
 \hline
 \end{array}$$

3. 
$$\begin{array}{r}
 534 \\
 -355 \\
 \hline
 \end{array}$$

Find the missing factor in each problem.

4.  $5m = 45$       5.  $8x = 24$       6.  $7w = 49$       7.  $3y = 36$

$$m = \underline{\hspace{2cm}} \quad x = \underline{\hspace{2cm}} \quad w = \underline{\hspace{2cm}} \quad y = \underline{\hspace{2cm}}$$

**• Rounding Numbers to Estimate**

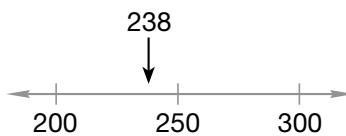
- To round a number to the nearest hundred:

1. Look at the tens place.
2. Ask: Is the digit in the tens place 5 or more? (5, 6, 7, 8, 9)

Yes → Add 1 to the hundreds place.

No → The hundreds place stays the same.

3. Replace the numbers after the hundreds place with zeros.



238 3 is less than 5

238 is closer to 200 than to 300.

238 rounds to 200.

**Practice:**

Round each number to the nearest hundred.

1. <u>614</u> → _____	2. <u>583</u> → _____	3. <u>149</u> → _____
4. <u>1735</u> → _____	5. <u>4087</u> → _____	6. <u>50</u> → _____
7. <u>904</u> → _____	8. <u>317</u> → _____	9. <u>851</u> → _____

## • Adding and Subtracting Decimal Numbers, Part 1

- Line up the decimal points carefully.

hundredths  
tenths  
wholes

$$\begin{array}{r}
 1 \\
 4.20 \\
 + 0.98 \\
 \hline
 5.18
 \end{array}$$

All decimal points are in line.

Pennies  
Dimes  
Dollars

$$\begin{array}{r}
 0.18 \\
 \$4.18 \\
 - \$4.09 \\
 \hline
 \$0.09
 \end{array}$$

All decimal points are in line.

### Practice:

Find each sum or difference. Remember to write the dollar sign in money problems.

1. 
$$\begin{array}{r}
 \$5.74 \\
 + \$2.38 \\
 \hline
 \end{array}$$

2. 
$$\begin{array}{r}
 \$2.18 \\
 + \$1.99 \\
 \hline
 \end{array}$$

3. 
$$\begin{array}{r}
 \$0.51 \\
 + \$0.60 \\
 \hline
 \end{array}$$

4. 
$$\begin{array}{r}
 3.46 \\
 + 3.35 \\
 \hline
 \end{array}$$

5. 
$$\begin{array}{r}
 7.08 \\
 - 5.49 \\
 \hline
 \end{array}$$

6. 
$$\begin{array}{r}
 4.68 \\
 - 2.81 \\
 \hline
 \end{array}$$

7. 
$$\begin{array}{r}
 4.30 \\
 - 1.26 \\
 \hline
 \end{array}$$

8. 
$$\begin{array}{r}
 0.47 \\
 - 0.28 \\
 \hline
 \end{array}$$

9. 
$$\begin{array}{r}
 24.1 \\
 - 16.5 \\
 \hline
 \end{array}$$

## • **Multiplying Two-Digit Numbers, Part 1**

- To multiply a two-digit number by a one-digit number:

1. Write the larger number on top.
2. Multiply the ones column by the bottom number.
3. Carry the tens portion.
4. Multiply the bottom number by the tens column in the top number. Then add the carried tens to that product.

$$\begin{array}{r}
 2 \\
 \times 46 \\
 \hline
 4
 \end{array}
 \rightarrow
 \begin{array}{r}
 2 \\
 \times 46 \\
 \hline
 184
 \end{array}$$

## Example:

$$\begin{array}{r}
 & 1 \\
 & \boxed{2} \boxed{5} \\
 \times & \boxed{3} \\
 \hline
 & 5
 \end{array}
 \quad \begin{array}{l}
 1. \ 3 \times 5 = 15. \text{ Write the 5.} \\
 2. \text{ Carry the 1 (ten).}
 \end{array}$$

$$\begin{array}{r}
 & 1 \\
 & \swarrow 25 \\
 \times & 3 \\
 \hline
 & 75
 \end{array}
 \quad
 \begin{array}{l}
 3. \ 3 \times 2 = 6; 6 + 1 = 7. \\
 \text{Write the 7.}
 \end{array}$$

## **Practice;**

Find each product.

$$\begin{array}{r} 1. \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 4. \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 51 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 8. \\ \times 2 \\ \hline \end{array}$$

- **Parentheses and the Associative Property**
- **Naming Lines and Segments**

**Parentheses and the Associative Property**

- The **Associative Property of Addition** states that how the numbers are grouped does not affect the **sum**. We do the work **inside the parentheses** first.

$$(3 + 4) + 5 = 12$$

$$3 + (4 + 5) = 12$$

- The **Associative Property of Multiplication** states that how the numbers are grouped does not affect the **product**.

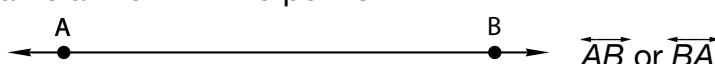
$$(3 \times 4) \times 2 = 24$$

$$3 \times (4 \times 2) = 24$$

- The Associative Property does not apply to subtraction or division.

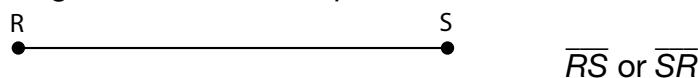
**Naming Lines and Segments**

- Name a line with two points.



This is line  $AB$ . It is also line  $BA$ .

- Name a segment with two endpoints.



This is segment  $RS$ . It is also segment  $SR$ .

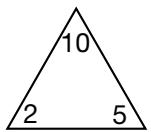
**Practice:**

1.  $7 - (2 + 5) =$  \_\_\_\_\_
2.  $8 + (6 - 4) =$  \_\_\_\_\_
3.  $5 \times (6 - 3) =$  \_\_\_\_\_
4.  $3 \times (12 - 5) =$  \_\_\_\_\_
5.  $6 + (5 \times 2) + 4 =$  \_\_\_\_\_
6.  $4 + (3 \times 10) - 2 =$  \_\_\_\_\_

**• Relating Multiplication and Division, Part 1**

- To find a missing factor, divide.

Division “undoes” multiplication because division and multiplication are inverse operations.



$$5 \times w = 10$$

$$w = 10 \div 5$$

$$w = 2$$

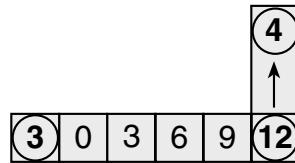
$$n \times 2 = 10$$

$$n = 10 \div 2$$

$$n = 5$$

- A multiplication table can also be used to find missing factors.

	0	1	2	3	4
0	0	0	0	0	0
1	0	1	2	3	4
2	0	2	4	6	8
3	0	3	6	9	12
4	0	4	8	12	16

**Practice:**

Divide.

1.  $2 \overline{)10}$

2.  $6 \overline{)24}$

3.  $5 \overline{)30}$

4.  $7 \overline{)42}$

5.  $9 \overline{)18}$

6.  $8 \overline{)32}$

7.  $9 \overline{)54}$

8.  $4 \overline{)28}$

Write the three remaining facts from the fact family.

9.  $4 \overline{)12}$  \_\_\_\_\_  $\div$  \_\_\_\_\_ = \_\_\_\_\_

\_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

\_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

## • Relating Multiplication and Division, Part 2

- With one multiplication fact we can form one more multiplication fact and two division facts.
- Below are three ways to show eighteen **divided by** three.

$$3) \overline{18} \quad 18 \div 3 \quad \frac{18}{3}$$

- Always say the greater number (**dividend**) first.

### ***Practice:***

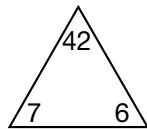
Divide.

1.  $64 \div 8 =$  \_\_\_\_\_    2.  $45 \div 9 =$  \_\_\_\_\_    3.  $28 \div 7 =$  \_\_\_\_\_

4.  $\frac{25}{5} =$  \_\_\_\_\_      5.  $\frac{27}{9} =$  \_\_\_\_\_      6.  $\frac{24}{4} =$  \_\_\_\_\_

Use digits and three different symbols to show:

9. Use the numbers 7, 42, and 6 to write two multiplication facts and two division facts.



$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \quad \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$
  
$$\underline{\hspace{1.5cm}} \quad \underline{\hspace{1.5cm}}$$

**• Multiplying Two-Digit Numbers, Part 2**

- When multiplying two-digit numbers, sometimes the product of the ones digits is a two-digit number.
- We can use mental math or pencil and paper to carry tens into the tens column.
- To multiply two-digit numbers:
  - Multiply by the ones digit.
  - If the product is a two-digit number, write the last digit in the ones column.
  - Carry the first digit into the tens column.
  - Multiply by the tens digit.
  - Add the carried digit to that product.
  - Write the sum in the answer line.

**Example:**

$$\begin{array}{r} 1 \\ \times 32 \\ \hline 4 \end{array}$$

↑

- $7 \times 2 = 14$
- Write 4 in the ones column.
- Carry the 1.

$$\begin{array}{r} 1 \\ \times 32 \\ \hline 224 \end{array}$$

↑

- $7 \times 3 = 21$
- Add the carried 1 to that product ( $21 + 1 = 22$ ).
- Write the 22.

**Practice:**

Find each product using mental math or pencil and paper to carry. Remember to write the dollar sign in money problems.

1.  $\begin{array}{r} 17 \\ \times 4 \\ \hline \end{array}$

2.  $\begin{array}{r} 26 \\ \times 8 \\ \hline \end{array}$

3.  $\begin{array}{r} \$35 \\ \times 5 \\ \hline \end{array}$

4.  $\begin{array}{r} 51 \\ \times 3 \\ \hline \end{array}$

5.  $\begin{array}{r} \$96 \\ \times 6 \\ \hline \end{array}$

6.  $\begin{array}{r} 74 \\ \times 2 \\ \hline \end{array}$

7.  $\begin{array}{r} 65 \\ \times 8 \\ \hline \end{array}$

8.  $\begin{array}{r} \$49 \\ \times 9 \\ \hline \end{array}$

9.  $\begin{array}{r} 68 \\ \times 7 \\ \hline \end{array}$

## • Word Problems about Equal Groups, Part 1

- Some problems involve equal groups.
- Problems about equal groups follow a multiplication formula. We can find the total by multiplying the number of groups by the number of things in each group.

$$\begin{array}{r}
 \text{Number in each group} \\
 \times \text{Number of groups} \\
 \hline
 \text{Total}
 \end{array}
 \quad \text{Number of groups} \times \text{Number in each group} = \text{Total}$$

**Example:** Portia has 6 bottles of water. There are 12 ounces of water in each bottle. How many total ounces of water does Portia have?

**Solution:**

$  \begin{array}{r}  12 \text{ ounces in each bottle} \\  \times 6 \text{ bottles of water} \\  \hline  72 \text{ ounces of water}  \end{array}  $	<b>number in each group</b>
	<b>number of groups</b>
	<b>total</b>

### Practice:

1. There are 7 days in one week. How many days are in 6 weeks?

$$\begin{array}{r}
 \text{days in a week} \\
 \times \text{weeks} \\
 \hline
 \text{days}
 \end{array}$$

2. It takes four push pins to hang a poster. There are 9 posters in the classroom. How many push pins will it take to hang all of the posters?

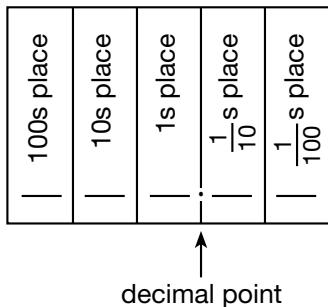
$$\begin{array}{r}
 \times \\
 \hline
 \text{push pins}
 \end{array}$$

3. A recipe makes 1 batch of biscuits. If the recipe calls for 4 eggs, how many eggs will be needed to make 5 batches of biscuits?

$$\begin{array}{r}
 \times \\
 \hline
 \text{eggs}
 \end{array}$$

## • Adding and Subtracting Decimal Numbers, Part 2

- Decimal place value from **hundreds** to **hundredths**:



- To add or subtract decimal numbers:

- Line up the decimal points first.
- Put zeros in empty spaces.
- Add or subtract.

- Sometimes we need to add or subtract decimal numbers that do not have the same number of decimal places.

**Examples:**  $1.28 + 3.35 + 2.40$

$6.37 - 4.9$

Line up the decimals

$$\begin{array}{r}
 \downarrow \\
 1 \ 1 \\
 1.28 \\
 3.35 \\
 + 2.40 \\
 \hline
 7.03
 \end{array}$$

Line up the decimals

$$\begin{array}{r}
 \downarrow \\
 5 \ 13 \\
 6.37 \\
 - 4.90 \\
 \hline
 1.47
 \end{array}$$

Use a zero as a placeholder.

### Practice:

- Which digit in 22.6 is in the tenths place? \_\_\_\_\_
- Which digit in 115.73 is in the hundredths place? \_\_\_\_\_
- Which digit in 10.2 is in the same place as the 9 in 1.91? \_\_\_\_\_

Find each sum or difference.

4.  $4.16 + 2.8 =$

$$\begin{array}{r}
 4.16 \\
 + . \\
 \hline
 \end{array}$$

5.  $4.16 - 2.8 =$

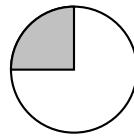
$$\begin{array}{r}
 4.16 \\
 - . \\
 \hline
 \end{array}$$

6.  $13.99 + 4.58 =$

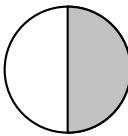
$$\begin{array}{r}
 13.99 \\
 + . \\
 \hline
 \end{array}$$

### • Percents

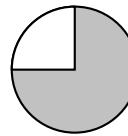
- Think about fractions as percents. A whole is 100%.



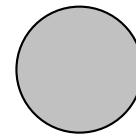
$$\frac{1}{4} = 25\%$$



$$\frac{1}{2} = 50\%$$

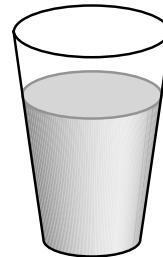


$$\frac{3}{4} = 75\%$$



$$1 = 100\%$$

- To estimate percents, find out if the amount shaded is more or less than a half. Which choices can you rule out?



**A** 30%

**B** 50%

**C** 70%

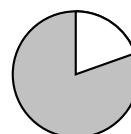
**D** 90%

We can rule out choice **A** and **B** because we know the glass is more than half full but not all the way full. To determine if the answer is **C** or **D**, we must determine if the glass is closer to 50% full or 100% full. From the picture we see the glass is closer to 70% full.

The answer is **D**.

### Practice:

1. If 75% of the flowers bloomed this year, what percent of the flowers did not bloom?
2. Compare: 27%   $\frac{1}{4}$
3. Compare: 95%   $\frac{1}{1}$
4. Which percent best describes the shaded portion of this circle?



**A** 10%

**B** 25%

**C** 50%

**D** 80%