

- **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:

$$\begin{array}{r} \\ \$ \cancel{3} \cancel{1} 6 \\ - \$ 278 \\ \hline \$ 38 \end{array}$$

Regroup across all places in one step:

$$\begin{array}{r} \\ \$ \cancel{3} \cancel{1} 6 \\ - \$ 278 \\ \hline \$ 38 \end{array}$$

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 .

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

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. $3y = 36$

$m = \underline{\hspace{2cm}}$

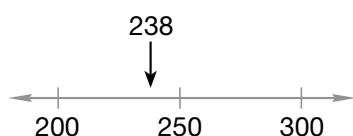
$x = \underline{\hspace{2cm}}$

$w = \underline{\hspace{2cm}}$

$y = \underline{\hspace{2cm}}$

• 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>6</u> 14 → _____ | 2. <u>5</u> 83 → _____ | 3. <u>1</u> 49 → _____ |
| 4. 1 <u>7</u> 35 → _____ | 5. 4 <u>0</u> 87 → _____ | 6. 50 → _____ |
| 7. 904 → _____ | 8. 317 → _____ | 9. 851 → _____ |

• Adding and Subtracting Decimal Numbers, Part 1

- Line up the decimal points carefully.

hundredths —
tenths —
wholes —

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

↑

All decimal points are in line.

Pennies —
Dimes —
Dollars —

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

↑

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:
 - Write the larger number on top.
 - Multiply the ones column by the bottom number.
 - Carry the tens portion.
 - Multiply the bottom number by the tens column in the top number. Then add the carried tens to that product.

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

Example:

$$\begin{array}{r} 1 \\ 25 \\ \times 3 \\ \hline \end{array}$$

- $3 \times 5 = 15$. Write the 5.
- Carry the 1 (ten).

$$\begin{array}{r} 1 \\ 25 \\ \times 3 \\ \hline 75 \end{array}$$

- $3 \times 2 = 6$; $6 + 1 = 7$.
Write the 7.

Practice:

Find each product.

1. $\begin{array}{r} 32 \\ \times 3 \\ \hline \end{array}$

2. $\begin{array}{r} 34 \\ \times 4 \\ \hline \end{array}$

3. $\begin{array}{r} 43 \\ \times 3 \\ \hline \end{array}$

4. $\begin{array}{r} 44 \\ \times 5 \\ \hline \end{array}$

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

6. $\begin{array}{r} 54 \\ \times 2 \\ \hline \end{array}$


7. $\begin{array}{r} 62 \\ \times 4 \\ \hline \end{array}$

8. $\begin{array}{r} 64 \\ \times 2 \\ \hline \end{array}$

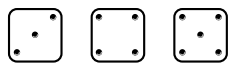
- **Parentheses and the Associative Property**
- **Naming Lines and Segments**

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.

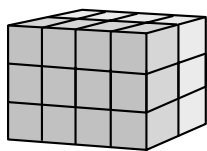


$$(3 + 4) + 5 = 12$$

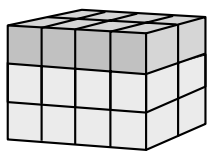


$$3 + (4 + 5) = 12$$

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



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

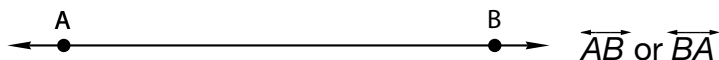


$$3 \times (4 \times 2) = 24$$

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

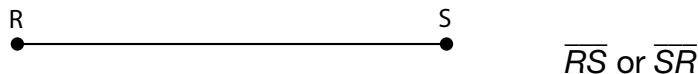
Naming Lines and Segments

- 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. $7 - (2 + 5) = \underline{\hspace{2cm}}$

2. $8 + (6 - 4) = \underline{\hspace{2cm}}$

3. $5 \times (6 - 3) = \underline{\hspace{2cm}}$

4. $3 \times (12 - 5) = \underline{\hspace{2cm}}$

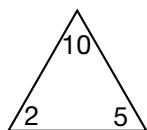
5. $6 + (5 \times 2) + 4 = \underline{\hspace{2cm}}$

6. $4 + (3 \times 10) - 2 = \underline{\hspace{2cm}}$

• 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

						4
						↑
3	0	3	6	9	12	

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. $28 \div 7 =$ _____

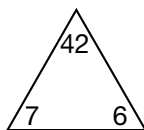
4. $\frac{25}{5} =$ _____ 5. $\frac{27}{9} =$ _____ 6. $\frac{24}{4} =$ _____

Use digits and three different symbols to show:

7. thirty divided by six $\overline{) \quad \quad \quad} \div \quad \quad \quad$

8. fifty-four divided by nine $\overline{) \quad \quad \quad} \div \quad \quad \quad$

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



$$\begin{array}{cc} \underline{\quad \quad \quad} \times \underline{\quad \quad \quad} & \underline{\quad \quad \quad} \times \underline{\quad \quad \quad} \\ \underline{\quad \quad \quad} \overline{) \quad \quad \quad} & \underline{\quad \quad \quad} \overline{) \quad \quad \quad} \end{array}$$

• 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:

$$\begin{array}{r}
 1 \\
 32 \\
 \times 7 \\
 \hline
 4
 \end{array}$$

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

$$\begin{array}{r}
 1 \\
 32 \\
 \times 7 \\
 \hline
 224
 \end{array}$$

- $7 \times 3 = 21$
- 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:

$\begin{array}{r} 12 \text{ ounces in each bottle} \\ \times 6 \text{ bottles of water} \\ \hline 72 \text{ ounces of water} \end{array}$	$\begin{array}{l} \text{number in each group} \\ \text{number of groups} \\ \hline \text{total} \end{array}$
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Practice:

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

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

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?

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

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?

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

• Adding and Subtracting Decimal Numbers, Part 2

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

100s place	10s place	1s place	$\frac{1}{10}$ s place	$\frac{1}{100}$ s place
—	—	—	—	—

↑
decimal point

- 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: $1.28 + 3.35 + 2.40$

Line up the decimals

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

$6.37 - 4.9$

Line up the decimals

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

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. $4.16 + 2.8 =$

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

5. $4.16 - 2.8 =$

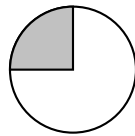
$$\begin{array}{r}
 4.16 \\
 - \quad . \\
 \hline
 \end{array}$$

6. $13.99 + 4.58 =$

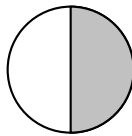
$$\begin{array}{r}
 13.99 \\
 + \quad . \\
 \hline
 \end{array}$$

• Percents

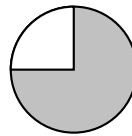
- Think about fractions as percents. A whole is 100%.



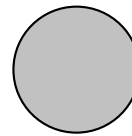
$$\frac{1}{4} = 25\%$$



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

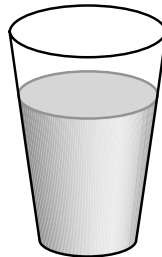


$$\frac{3}{4} = 75\%$$



$$1 = 100\%$$

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

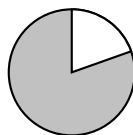
**A 30%****B 50%****C 70%****D 90%**

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:

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

**A 10%****B 25%****C 50%****D 80%**