

# Week 1

MA123: Mathematical Reasoning & Modeling  
(Spring 2021)

Instructor: Emmanuel Thompson

# Ratios & Rates

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## Ratios & Rates:

- Ratios are expressions that compare two quantities.
- Rates are a special type of ratio.
  - It is used to describe a relationship between two related quantities in different units.

# Example 1:

Simplify the rate of cans of soda compared to people

$$\frac{54 \text{ cans of soda}}{4 \text{ people}}$$

$$\frac{\cancel{54} 27}{\cancel{4} 2}$$

$$\Rightarrow \frac{27}{2}$$

$$\frac{\text{Cans of Soda}}{\text{people}}$$

# Example 2:

Enter the ratio as a fraction in lowest terms

45 minutes to 10 minutes

$$\frac{45}{10} = \frac{9}{2}$$

# Example 3:

Write the ratio as a ratio of whole numbers in lowest terms

\$0.40 to \$0.50

$$\begin{aligned}\frac{0.40}{0.50} &= \frac{0.40 \times 10}{0.50 \times 10} \\ &= \frac{4.0}{5.0} = \frac{4}{5}\end{aligned}$$

# Example 4:

Jayda takes 4 hours to deliver 248 newspapers on her paper route. What is the rate per hour at which she delivers the newspapers?

$$\frac{248}{4} = 62$$

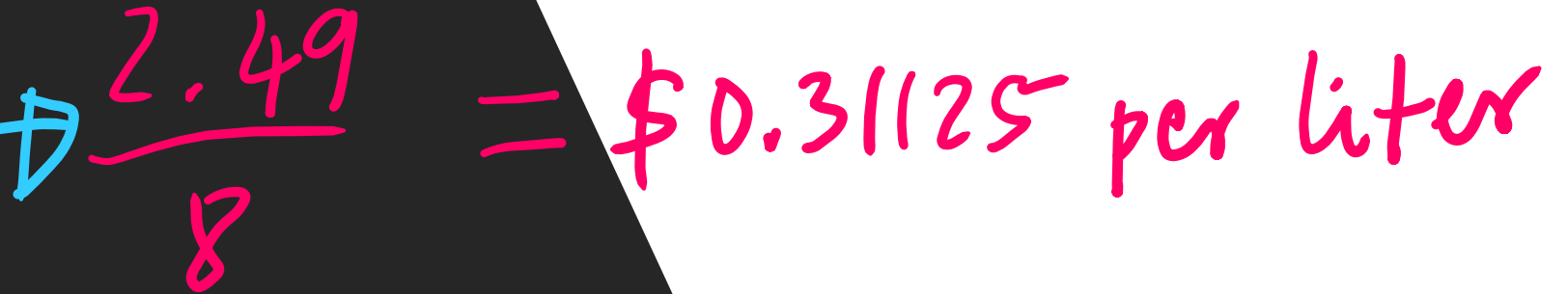
# Example 5:

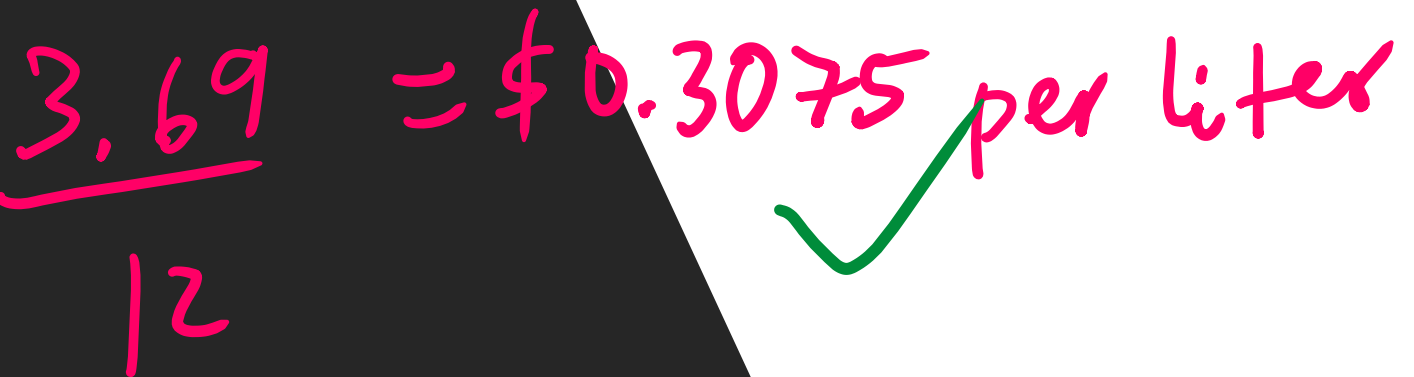
Which is the better deal?

☐ \$2.49 for 8 liters

☒ \$3.69 for 12 liters

→ better deal!


$$\rightarrow \frac{2.49}{8} = \$0.31125 \text{ per liter}$$


$$\rightarrow \frac{3.69}{12} = \$0.3075 \text{ per liter} \checkmark$$