Welcome to Fraction Representation!

This worksheet will help you master representing fractions from halves to tenths using drawings, tools, and standard notation. You'll learn what numerators and denominators mean and how to show fractions in many different ways. Understanding fraction representation is key to becoming a math superstar!

1 Understanding Fraction Representation

Fractions show equal parts of a whole. We can represent them using drawings, number lines, fraction strips, and standard notation.

1.1 Fraction Basics: Numerator and Denominator

- **Numerator:** The number above the fraction bar - tells how many parts we have
- **Denominator:** The number below the fraction bar - tells how many equal parts make one whole
- **Proper Fraction:** Numerator is less than denominator (like $\frac{3}{4}$)
- **Unit Fraction:** Numerator is 1 (like $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$)

1.2 Fractions from Halves to Tenths

Fraction	Name	Visual Representation	Meaning
$\frac{1}{2}$	One half		1 of 2 equal parts
$\frac{1}{3}$	One third		1 of 3 equal parts
$\frac{1}{4}$	One quarter		1 of 4 equal parts
$\frac{1}{5}$	One fifth		1 of 5 equal parts
$\frac{3}{8}$	Three eighths		3 of 8 equal parts

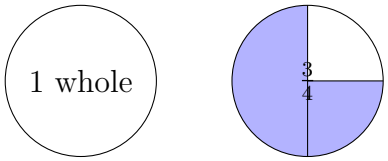
2 Different Ways to Represent Fractions

Fractions can be shown in multiple ways: as parts of a whole, on a number line, with fraction strips, and in real-world situations.

2.1 Circle Representations

Example 1: Fraction Circles

Represent $\frac{3}{4}$ using fraction circles:

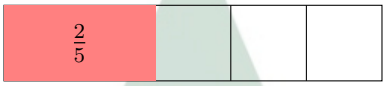


3 parts colored out of 4 total parts

2.2 Bar/Strip Representations

Example 2: Fraction Bars

Represent $\frac{2}{5}$ using fraction bars:

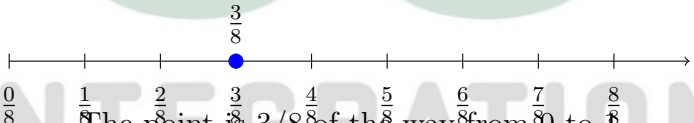


2 parts colored out of 5 total parts

2.3 Number Line Representations

Example 3: Number Line

Locate $\frac{3}{8}$ on the number line:



The point is 3/8 of the way from 0 to 1

2.4 Set Representations

Example 4: Set Model

Represent $\frac{3}{5}$ using a set of objects:

3 colored stars out of 5 total stars = $\frac{3}{5}$

Master fraction representation to understand parts of wholes in many different ways!

Fraction Representation Art Gallery

Art Project 1: Show Fractions in Different Ways!

Represent each fraction using circles, bars, and number lines. Use different colors for each representation!

Problem 1: Multiple Representations

Show each fraction in three different ways:

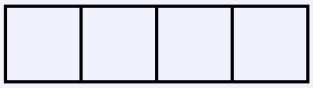
a) Represent $\frac{2}{3}$ using a circle

b) Represent $\frac{3}{4}$ using a fraction bar

c) Represent $\frac{4}{5}$ on a number line

d) Represent $\frac{1}{2}$ using objects

a) Circle for $\frac{2}{3}$

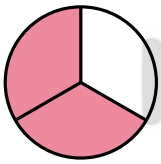


b) Bar for $\frac{3}{4}$

c) Number line for $\frac{4}{5}$

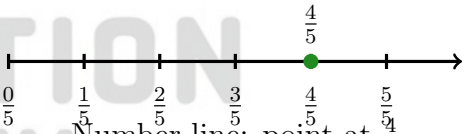
d) Objects for $\frac{1}{2}$

Solution Let's represent fractions in multiple ways!

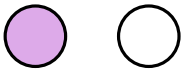


Circle: $\frac{2}{3} = 2$ of 3 parts

Bar: $\frac{3}{4} = 3$ of 4 parts



Number line: point at $\frac{4}{5}$



Objects: 1 of $2 = \frac{1}{2}$

Problem 2: Pizza Fraction Representations

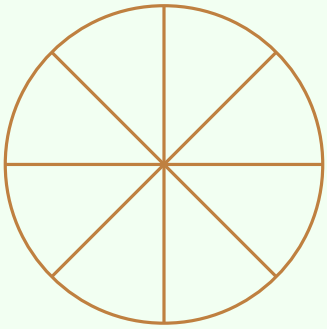
A pizza is cut into 8 equal slices. Represent these fractions in different ways:

a) Draw $\frac{5}{8}$ of the pizza using a circle

b) Show $\frac{5}{8}$ using a fraction bar

c) Mark $\frac{5}{8}$ on a number line

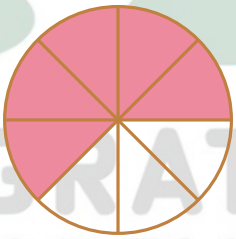
d) If you eat 3 slices, what fraction is left? Show two representations.



Pizza Template - 8 Equal Slices

Solution Let's represent pizza fractions!

a) **Circle representation of $\frac{5}{8}$:**

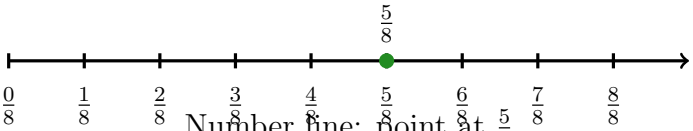


Circle: $\frac{5}{8}$ = 5 slices colored

b) **Bar representation of $\frac{5}{8}$:**

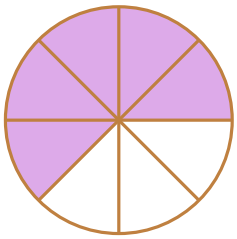
Bar: $\frac{5}{8}$ = 5 of 8 parts

c) **Number line for $\frac{5}{8}$:**



Number line: point at $\frac{5}{8}$

d) **Fraction left after eating 3 slices:** 8 - 3 = 5 slices left = $\frac{5}{8}$



Circle: $\frac{5}{8}$ left

Set: 5 of 8 slices left

Problem 3: Fraction Toolbox Challenge

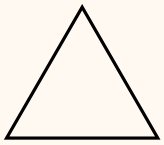
Use different tools to represent these fractions:

a) Use pattern blocks to show $\frac{2}{3}$

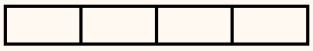
b) Use fraction strips to show $\frac{3}{4}$

c) Use a ruler to show $\frac{7}{10}$

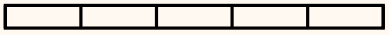
d) Use base-ten blocks to show $\frac{4}{5}$



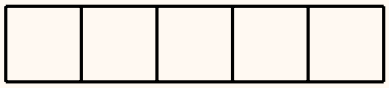
a) Pattern Blocks



b) Fraction Strips



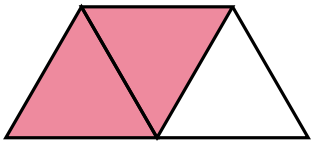
c) Ruler



d) Base-Ten Blocks

Solution Let's use our fraction tools!

a) **Pattern blocks for $\frac{2}{3}$:**

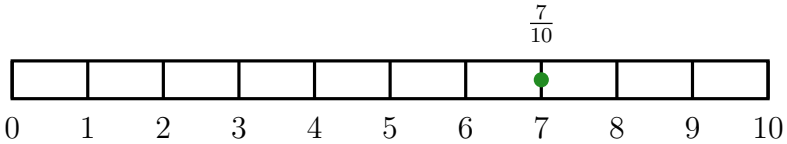


2 of 3 triangles = $\frac{2}{3}$

b) **Fraction strips for $\frac{3}{4}$:**

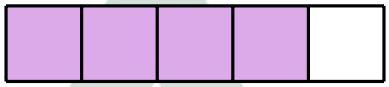
3 of 4 strips = $\frac{3}{4}$

c) **Ruler for $\frac{7}{10}$:**



7 of 10 centimeters = $\frac{7}{10}$

d) **Base-ten blocks for $\frac{4}{5}$:**



4 of 5 blocks = $\frac{4}{5}$

Problem 4: Real-World Fraction Representations

Represent these real-world situations using fractions:

a) In a class of 12 students, 7 are girls. Represent the fraction of girls.

b) A recipe uses 3 cups of flour out of 4 cups needed. Show the fraction used.

c) A bookshelf has 10 books, and 3 are mystery books. Represent the fraction.

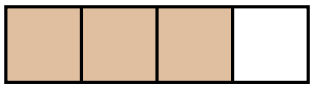
d) A soccer game is 90 minutes long. If 60 minutes have passed, what fraction is complete?

Solution Let's represent real-world fractions!

a) **Girls in class:** 7 girls out of 12 students = $\frac{7}{12}$

$\frac{7}{12}$ are girls

b) **Flour used:** 3 cups used out of 4 cups needed = $\frac{3}{4}$

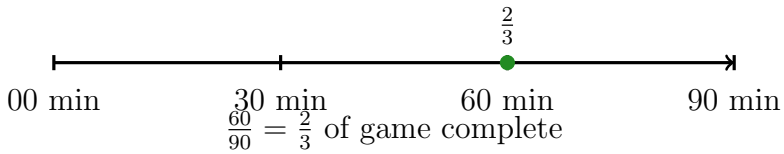


$\frac{3}{4}$ of flour used

c) **Mystery books:** 3 mystery books out of 10 total = $\frac{3}{10}$

$\frac{3}{10}$ are mystery books

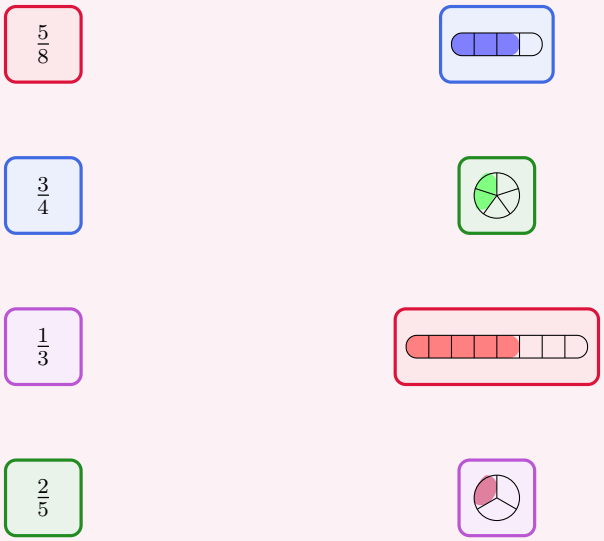
d) **Soccer game:** 60 minutes passed out of 90 minutes = $\frac{60}{90} = \frac{2}{3}$



$\frac{60}{90} = \frac{2}{3}$ of game complete

Problem 5: Fraction Representation Match

Match each fraction with its correct representation:



Solution Let's match fractions with their representations!

$\frac{3}{4}$ MATCH! → 3 of 4 bars

$\frac{2}{5}$ MATCH! → 2 of 5 circle parts

$\frac{5}{8}$ MATCH! → 5 of 8 bars

$\frac{1}{3}$ MATCH! → 1 of 3 circle parts

Explanation:

- $\frac{3}{4}$ matches 3 colored bars out of 4 total bars
- $\frac{2}{5}$ matches 2 colored circle parts out of 5 total parts
- $\frac{5}{8}$ matches 5 colored bars out of 8 total bars
- $\frac{1}{3}$ matches 1 colored circle part out of 3 total parts

Problem 6: Create Your Own Fraction Representations

Create different representations for each fraction:

a) Create three different representations of $\frac{3}{4}$

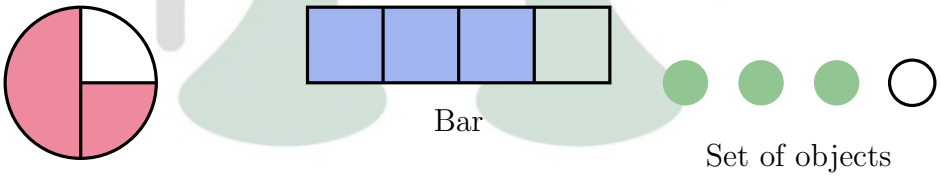
b) Show $\frac{2}{3}$ using circles, bars, and a number line

c) Represent $\frac{5}{6}$ in two different ways

d) Draw $\frac{7}{10}$ using your choice of representation

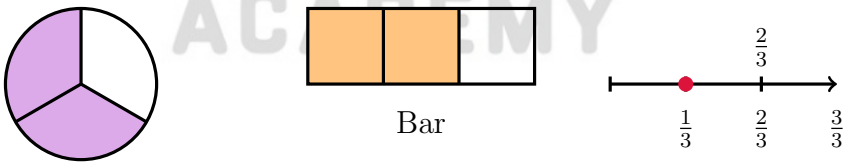
Solution Let's create our own fraction representations!

a) **Three representations of $\frac{3}{4}$:**



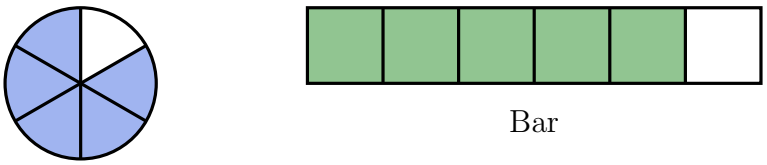
Circle Bar Set of objects

b) $\frac{2}{3}$ **in three ways:**



Circle Bar Number line

c) **Two representations of $\frac{5}{6}$:**



Circle Bar

d) $\frac{7}{10}$ **representation:**

Bar representation of $\frac{7}{10}$
7 colored parts out of 10 total parts

Problem 7: Fraction Representation Challenge

Solve these fraction representation challenges:

a) Draw a shape divided into 6 equal parts and color $\frac{4}{6}$

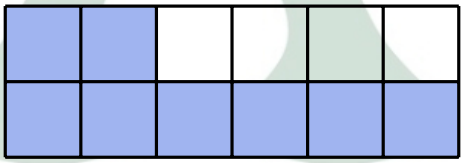
b) Create a number line from 0 to 1 and mark $\frac{3}{8}$, $\frac{5}{8}$, and $\frac{7}{8}$

c) Use fraction strips to show that $\frac{2}{4} = \frac{1}{2}$

d) Represent $\frac{3}{5}$ using a set of 10 objects

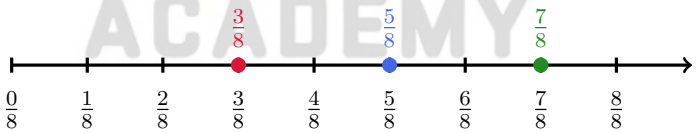
Solution Let's solve these representation challenges!

a) **Shape divided into 6 equal parts:**

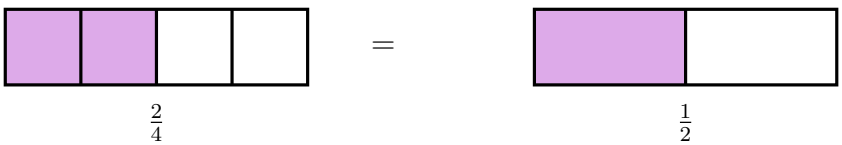


4 of 6 rows colored = $\frac{4}{6}$

b) **Number line with eighths:**



c) **Equivalent fractions with strips:**



Both show the same amount! $\frac{2}{4} = \frac{1}{2}$

d) $\frac{3}{5}$ **of 10 objects:**

6 of 10 objects $= \frac{6}{10} = \frac{3}{5}$
$\frac{3}{5}$ of $10 = 6$ objects

Problem 8: Advanced Fraction Representation

These challenges will test your fraction representation skills!

a) Represent $\frac{2}{3}$ on a number line that goes from 0 to 2

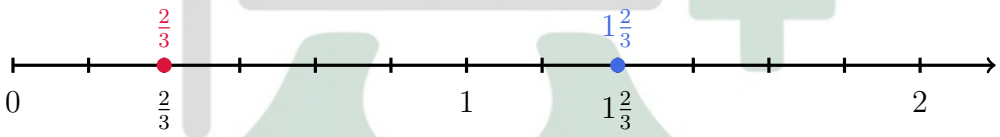
b) Draw a rectangle divided into 12 equal parts and color $\frac{5}{12}$ one color and $\frac{3}{12}$ another color

c) Create a fraction wall showing halves, thirds, fourths, and sixths

d) Represent the fraction of vowels in the word "MATHEMATICS"

Solution Advanced fraction representations!

a) **$\frac{2}{3}$ on 0 to 2 number line:**

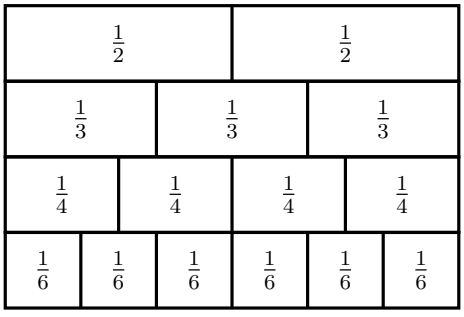


b) **Rectangle with two fractions:**

$\frac{5}{12}$ blue $\frac{3}{12}$ red $\frac{4}{12}$ white

Total: $\frac{5}{12} + \frac{3}{12} + \frac{4}{12} = \frac{12}{12} = 1$ whole

c) **Fraction wall:**



d) **Vowels in "MATHEMATICS":**

M A T H E M A T I C S

4 vowels out of 11 letters = $\frac{4}{11}$

Problem 9: Mixed Representation Challenge

Show each fraction using the specified representation method:

a) Use a circle to show $\frac{5}{6}$

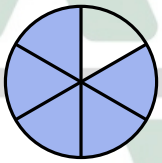
b) Use a bar model to show $\frac{7}{8}$

c) Use a number line to show $\frac{4}{10}$

d) Use objects to show $\frac{2}{5}$ of 15 items

Solution Mixed representation challenge!

a) **Circle for $\frac{5}{6}$:**

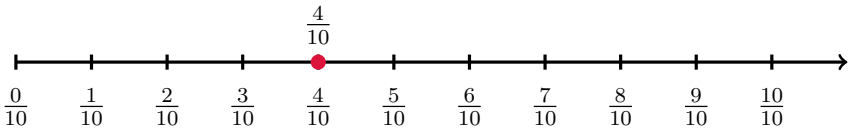


5 of 6 parts colored = $\frac{5}{6}$

b) **Bar for $\frac{7}{8}$:**

7 of 8 parts colored = $\frac{7}{8}$

c) **Number line for $\frac{4}{10}$:**



Point at $\frac{4}{10}$ on the number line

d) **Objects for $\frac{2}{5}$ of 15:**

6 of 15 objects = $\frac{6}{15} = \frac{2}{5}$
$\frac{2}{5}$ of 15 = 6 objects

Problem 10: Creative Fraction Art

Create a fraction artwork that includes:

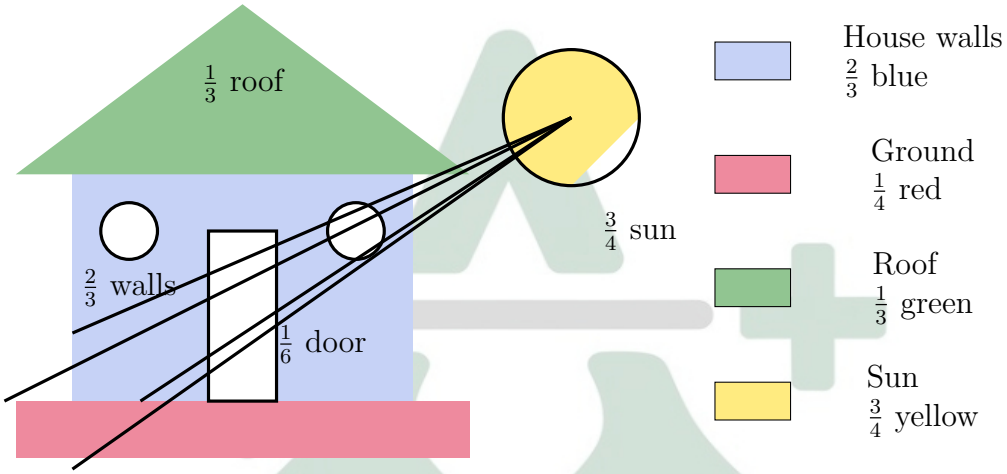
a) At least 3 different fractions

b) At least 2 different representation methods

c) A color key showing what each fraction represents

d) A creative design or picture

Solution Let's create fraction art!



Artwork Explanation:

- **Roof:** $\frac{1}{3}$ of the triangle area is colored green (triangular representation)
- **House walls:** $\frac{2}{3}$ of the rectangle is colored blue (area representation)
- **Door:** $\frac{1}{6}$ of the house width is the door (linear measurement)
- **Sun:** $\frac{3}{4}$ of the circle is colored yellow (circular representation)
- **Representation methods:** Rectangles, triangles, circles, and linear measurements
- **Creative design:** A colorful house scene with proper spacing

Fraction Details:

- Roof: Triangle divided into 3 equal areas, 1 part green = $\frac{1}{3}$
- Walls: Rectangle divided into 3 equal vertical sections, 2 parts blue = $\frac{2}{3}$
- Door: House width divided into 6 equal parts, door = 1 part = $\frac{1}{6}$
- Sun: Circle divided into 4 equal parts, 3 parts yellow = $\frac{3}{4}$

CONGRATULATIONS FRACTION REPRESENTATION EXPERT!

YOU MASTERED FRACTION REPRESENTATION!

1st

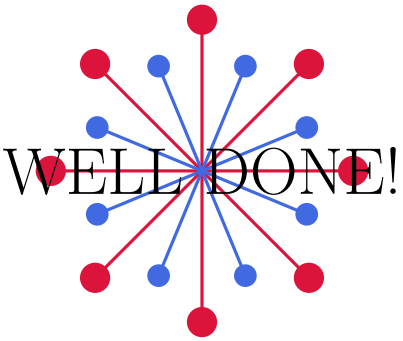
Fraction Representation Expert!

You've completed ALL the Fraction Representation Challenges!

You can now represent fractions like a pro:

- Using circles and shapes
- With fraction bars and strips
- On number lines
- With sets of objects
- Using different tools
- In real-world situations
- With multiple representations
- For fractions from halves to tenths

Keep looking for fractions in the world around you - they're everywhere!



3 Your Turn! Fraction Representation Practice

Problem 1: Basic Fraction Representation

Represent each fraction in two different ways (draw and describe):

a) $\frac{2}{3}$

b) $\frac{3}{5}$

c) $\frac{5}{8}$

d) $\frac{4}{10}$

Solution

Problem 2: Multiple Representations

Show each fraction using circles, bars, and number lines:

a) $\frac{1}{2}$

b) $\frac{2}{3}$

c) $\frac{3}{4}$

d) $\frac{3}{8}$

Solution

Problem 3: Real-World Representation

Represent these real-world situations as fractions:

a) 5 sunny days out of 7 days in a week

b) 7 correct answers on a 10-question test

c) 2 slices of pizza eaten from an 8-slice pizza

d) 9 students present in a class of 12 students

e) 4 hours of TV watched in a 24-hour day

Solution

Problem 4: Fraction Tools

Use different tools to represent these fractions:

a) Use pattern blocks to show $\frac{2}{3}$

b) Use fraction strips to show $\frac{3}{4}$

c) Use base-ten blocks to show $\frac{4}{5}$

d) Use money to show $\frac{3}{4}$ of a dollar

Solution

Problem 5: Advanced Representation Challenges

Solve these advanced fraction representation problems:

a) Represent $\frac{2}{3}$ on a number line from 0 to 2

b) Draw a shape showing $\frac{3}{4}$ and $\frac{6}{8}$ are equivalent

c) Create a fraction wall showing halves, thirds, fourths, and sixths

Solution

Problem 6: Create Your Own Representations

Create your own fraction representations:

a) Design a new way to represent $\frac{3}{4}$

b) Create a fraction game using different representations

c) Draw a picture that shows $\frac{2}{3}$ of something in your classroom

d) Make up a story problem and show the fraction representation

Solution

Problem 7: Fraction Art Project

Create a fraction art project that includes:

a) At least 3 different fractions

b) At least 2 different representation methods

c) A color key showing what each fraction represents

d) A written explanation of your artwork

Solution

Problem 8: Fraction Story Problems

Create and solve fraction story problems:

a) Make up a sports story with fractions and represent them visually

b) Design a shopping story with fraction discounts and show representations

Solution

Problem 9: Fraction Comparison Representations

Represent these fraction comparisons visually:

a) Show why $\frac{2}{3} > \frac{1}{2}$ using circles

b) Demonstrate $\frac{3}{4} = \frac{6}{8}$ using fraction strips

c) Prove $\frac{4}{5} > \frac{3}{4}$ using number lines

Solution

Problem 10: Fraction Master Challenge

Solve these master-level fraction representation problems:

a) Represent $\frac{2}{3} + \frac{1}{6}$ using multiple methods

b) Show $\frac{3}{4} - \frac{1}{8}$ visually

Solution

Fraction Representation Summary

- **Circle Model:** Divide a circle into equal parts and shade some parts
- **Bar/Strip Model:** Divide a rectangle into equal parts and shade some parts
- **Number Line:** Mark the fraction as a point between 0 and 1
- **Set Model:** Show a set of objects with some objects selected
- **Area Model:** Shade part of a shape or region
- **Length Model:** Use measurement to show fractions
- **Numerator:** Tells how many parts we have (top number)
- **Denominator:** Tells how many equal parts make one whole (bottom number)
- **Proper Fraction:** Less than 1 whole (numerator ¡ denominator)
- **Unit Fraction:** Numerator is 1 ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, etc.)

Remember: Being able to represent fractions in multiple ways helps you understand them deeply and solve problems flexibly!