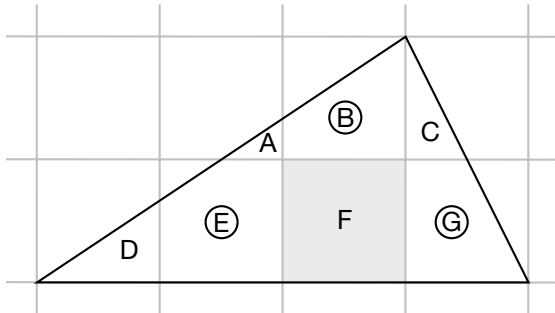


• Estimating Perimeter, Area, and Volume

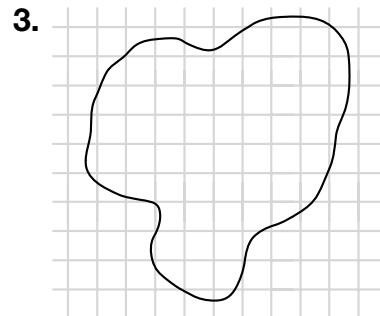
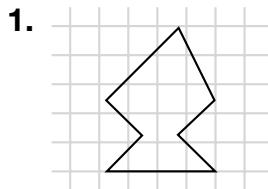
- We can use grids to estimate the areas and perimeters of shapes that are not regular polygons, or when we don't know the dimensions of the shape.



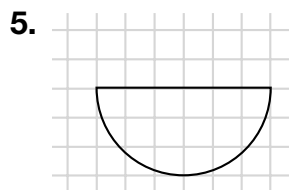
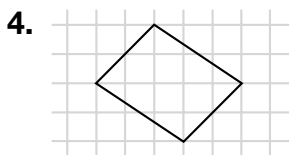
- To estimate the area of the triangle, count the whole squares (F) and the mostly full squares (E, B, G).
- Do not count squares that are mostly empty (D, A, C).
- To estimate the perimeter, add the estimated lengths of the sides. The base is 4 units. We can see that one side is a little more than 3 units. The third side is a little more than 2 units. So, we estimate the perimeter to be between 9 units and 10 units.
- One way to estimate the volume of a container is to fill the container with unit cubes and count the cubes.

Practice:

Estimate the area of each figure on these grids. Each small square represents one square inch. Remember to write the units.



Estimate the perimeter of each figure on these grids.



• Reducing Fractions

- Use mental math to divide the numerator (top number) and the denominator (bottom number) by the same number.

Example: Reduce $\frac{8}{12}$ (*Hint:* Divide 8 and 12 by 4)

$$\frac{8}{12} = \frac{8 \div 4}{12 \div 4} = \frac{2}{3}$$

Practice:

Write the reduced form of each fraction. Some may already be reduced.

1. $\frac{2}{6} =$ _____

Hint: $\div 2$

2. $\frac{3}{6} =$ _____

Hint: $\div 3$

3. $\frac{4}{8} =$ _____

Hint: $\div 4$

4. $\frac{6}{9} =$ _____

5. $\frac{2}{12} =$ _____

6. $\frac{4}{12} =$ _____

7. $\frac{4}{10} =$ _____

8. $\frac{10}{30} =$ _____

9. $\frac{7}{10} =$ _____

10. $\frac{6}{10} =$ _____

11. $\frac{6}{8} =$ _____

12. $\frac{6}{12} =$ _____

• Multiplying a Three-Digit Number by a Two-Digit Number

- Use mental math to carry.
- Indent using 0 as a placeholder.

Practice:

Multiply. Remember to write the dollar sign and decimal point in money problems.

1.
$$\begin{array}{r} 256 \\ \times 32 \\ \hline + \\ \hline \end{array}$$

2.
$$\begin{array}{r} 435 \\ \times 18 \\ \hline + \\ \hline \end{array}$$

3.
$$\begin{array}{r} \$1.67 \\ \times 23 \\ \hline + \\ \hline \end{array}$$

4.
$$\begin{array}{r} 511 \\ \times 30 \\ \hline + \\ \hline \end{array}$$

5.
$$\begin{array}{r} \$8.04 \\ \times 29 \\ \hline + \\ \hline \end{array}$$

6.
$$\begin{array}{r} 543 \\ \times 21 \\ \hline + \\ \hline \end{array}$$

7.
$$\begin{array}{r} \$4.92 \\ \times 36 \\ \hline + \\ \hline \end{array}$$

8.
$$\begin{array}{r} 714 \\ \times 35 \\ \hline + \\ \hline \end{array}$$

• Simplifying Fraction Answers

- Change an improper fraction answer to a mixed number.
- Always **reduce** fraction answers if possible.
- Sometimes it helps to “break apart” a mixed number answer and change the improper fraction to another mixed number.

Example:

$$\begin{array}{r} 3\frac{4}{5} \\ + 4\frac{3}{5} \\ \hline 7\frac{7}{5} = 7 + 1\frac{2}{5} = 8\frac{2}{5} \end{array}$$

Practice:

Simplify the answer to each sum or difference. (Change improper fractions to mixed numbers, and reduce if possible.)

1. $\frac{3}{5} + \frac{3}{5} =$ _____

2. $\frac{5}{8} - \frac{1}{8} =$ _____

3.
$$\begin{array}{r} 2\frac{3}{7} \\ + 1\frac{6}{7} \\ \hline \end{array}$$

= _____

4.
$$\begin{array}{r} 6\frac{1}{4} \\ + 3\frac{3}{4} \\ \hline \end{array}$$

= _____

5.
$$\begin{array}{r} 5\frac{5}{9} \\ - 3\frac{2}{9} \\ \hline \end{array}$$

= _____

6.
$$\begin{array}{r} 4\frac{6}{10} \\ + 7\frac{8}{10} \\ \hline \end{array}$$

= _____

• Renaming Fractions

- Rename fractions using the loop method.

Multiply the numbers in the loop and divide by the number outside the loop.

Example:

$$\frac{3}{4} = \frac{?}{12} \quad 12 \times 3 = 36 \quad \frac{3}{4} = \frac{9}{12}$$

$$36 \div 4 = 9$$

Practice:

Complete each equivalent fraction.

1. $\frac{1}{5} = \frac{\quad}{15}$

2. $\frac{2}{3} = \frac{\quad}{15}$

3. $\frac{4}{7} = \frac{\quad}{14}$

4. $\frac{1}{2} = \frac{\quad}{14}$

5. $\frac{5}{8} = \frac{\quad}{24}$

6. $\frac{5}{12} = \frac{\quad}{24}$

7. $\frac{4}{5} = \frac{\quad}{30}$

8. $\frac{5}{6} = \frac{\quad}{30}$

• **Common Denominators**

- To rename fractions so that they have a **common denominator**:

1. Look down the multiplication table column for each denominator.
2. Find the smallest number both columns share.
3. Rename. (Use the loop method.)

Example: $\frac{3}{4}$ and $\frac{4}{5}$

1. Go down the 4s column and the 5s column.
2. Find that they both share a 20.
3. Rename.

$$\frac{3}{4} = \frac{?}{20} \quad 20 \times 3 = 60 \quad \frac{15}{20}$$

$$60 \div 4 = 15$$

$$\frac{4}{5} = \frac{?}{20} \quad 20 \times 4 = 80 \quad \frac{16}{20}$$

$$80 \div 5 = 16$$

Practice:

1. Rename $\frac{1}{3}$ and $\frac{1}{7}$ so that they have a common denominator of 21.

$$\frac{1}{3} = \frac{\quad}{21}$$

$$\frac{1}{7} = \frac{\quad}{21}$$

2. Rename $\frac{3}{5}$ and $\frac{5}{6}$ so that they have a common denominator of 30.

$$\frac{3}{5} = \frac{\quad}{30}$$

$$\frac{5}{6} = \frac{\quad}{30}$$

Rename each pair of fractions using their least common denominator.

3. $\frac{2}{3} = \frac{\quad}{\quad}$

4. $\frac{1}{4} = \frac{\quad}{\quad}$

$$\frac{3}{4} = \frac{\quad}{\quad}$$

$$\frac{3}{8} = \frac{\quad}{\quad}$$

• Dividing by Two-Digit Numbers

- Use zero as a placeholder.
- When you multiply, if the answer is greater than the dividend, try a smaller number.
- If the ones digit in the divisor is 4 or less, round it down before guessing.

$$44 \overline{)163} \quad (\text{Think: } 40 \overline{)160})$$

- If the ones digit in the divisor is 5 or more, round it up before guessing.

$$46 \overline{)163} \quad (\text{Think: } 50 \overline{)160})$$

- Then use the four division steps to solve (divide, multiply, subtract, bring down).

Practice:

Divide using long division.

1. $22 \overline{)129}$

2. $17 \overline{)83}$

3. $57 \overline{)243}$

4. $72 \overline{)284}$

5. $51 \overline{)299}$

6. $14 \overline{)63}$

7. $25 \overline{)121}$

8. $84 \overline{)642}$

• Adding and Subtracting Fractions with Different Denominators

- To add or subtract fractions that have different denominators, first rename the fractions so that they have common denominators.
 - Find a common denominator.
 - Rename. (Use the loop method.)
 - Add or subtract the renamed fractions.

Example:

$$\begin{array}{r} \frac{2}{3} = \frac{6}{9} \\ + \frac{4}{9} = \frac{4}{9} \\ \hline \frac{10}{9} = 1\frac{1}{9} \end{array}$$

Practice:

Find each sum or difference.

1. $\frac{1}{4} = \frac{\quad}{8}$

$$+ \frac{3}{8} = \frac{\quad}{8}$$

2. $\frac{3}{4} = \frac{\quad}{8}$

$$- \frac{1}{2} = \frac{\quad}{8}$$

3. $\frac{2}{5} = \frac{\quad}{10}$

$$+ \frac{3}{10} = \frac{\quad}{10}$$

4. $\frac{5}{8} = \frac{\quad}{16}$

$$+ \frac{1}{4} = \frac{\quad}{16}$$

5. $\frac{4}{9} = \frac{\quad}{18}$

$$+ \frac{1}{3} = \frac{\quad}{18}$$

6. $\frac{6}{9} = \frac{\quad}{18}$

$$- \frac{2}{3} = \frac{\quad}{18}$$

7. $\frac{9}{10} = \frac{\quad}{20}$

$$- \frac{2}{5} = \frac{\quad}{20}$$

8. $\frac{7}{8} = \frac{\quad}{16}$

$$- \frac{1}{4} = \frac{\quad}{16}$$

• Adding and Subtracting Mixed Numbers with Different Denominators

- To add or subtract mixed numbers with different denominators:
 - Copy the problem vertically.
 - Rename the fractions so that they have common denominators.
 - Add or subtract the fraction side.
 - Add or subtract the whole numbers.
 - Reduce the fraction side.

Example:

$$\begin{array}{r} 3\frac{1}{7} = 3\frac{2}{14} \\ + 2\frac{6}{14} = 2\frac{6}{14} \\ \hline 5\frac{8}{14} = 5\frac{4}{7} \end{array}$$

Practice:

Find each sum or difference. Reduce when possible.

1. $2\frac{1}{3} + 1\frac{12}{15}$	$2\frac{1}{3} = 2$ —	2. $5\frac{3}{7} + 2\frac{5}{14}$	$5\frac{3}{7} =$ —
	$+ 1\frac{12}{15} = 1\frac{12}{15}$		$+$ — = —
	<hr/>		<hr/>

3. $4\frac{2}{3} + 3\frac{6}{9}$	$4\frac{2}{3} =$ —	4. $6\frac{1}{8} + 3\frac{3}{4}$	$6\frac{1}{8} =$ —
	$+$ — = —		$+$ — = —
	<hr/>		<hr/>

5. $3\frac{5}{8} - 2\frac{1}{4}$	$3\frac{5}{8} = 3\frac{5}{8}$	6. $2\frac{6}{10} - 2\frac{2}{5}$	$2\frac{6}{10} =$ —
	$- 2\frac{1}{4} = 2$ —		$-$ — = —
	<hr/>		<hr/>

7. $9\frac{11}{12} - 7\frac{5}{6}$	$9\frac{11}{12} =$ —	8. $5\frac{9}{14} - 4\frac{3}{7}$	$5\frac{9}{14} =$ —
	$-$ — = —		$-$ — = —
	<hr/>		<hr/>