Routine and Non-routine Problem

$$\sqrt[b]{x^a} = x^{\frac{a}{b}}$$

Routine problems can be solved easily using at least one math operation or a ratio.

Example: Devin walks $\frac{2}{3}$ of a km to a friend's house, $\frac{1}{4}$ km to a park, and $\frac{1}{2}$ km home. What is the total distance that Devin covers?

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1. **Understand**

   a. What are the given facts?

   - $\frac{2}{3}$ of a km to a friend's house
   - $\frac{1}{4}$ km to a park house, and
   - $\frac{1}{2}$ km to home

   b. What is asked?

   - What is the total distance that Devin covers?

Example: Devin walks $\frac{2}{3}$ of a km to a friend's house, $\frac{1}{4}$ km to a park, and $\frac{1}{2}$ km home. What is the total distance that Devin covers?

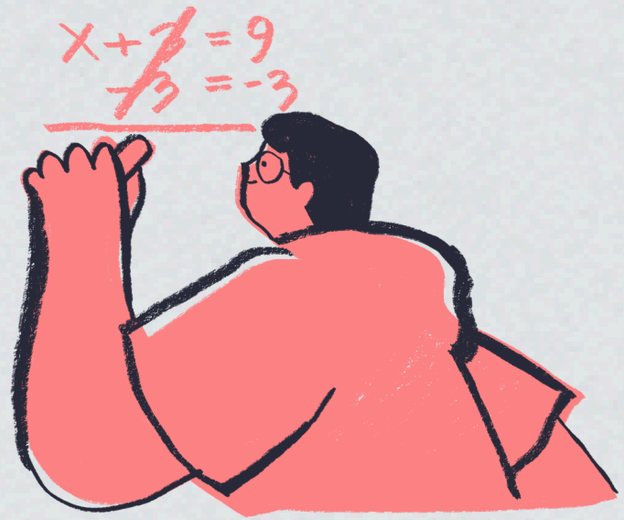
2. **Plan**

   a. What is the operation to be used?

      - Addition

   b. Number sentence?

      - $\frac{2}{3}$ km + $\frac{1}{4}$ km + $\frac{1}{2}$ km = N



3. **Solve the problem**

   - $\frac{2}{3} + \frac{1}{4} + \frac{1}{2} = \frac{8+3+6}{12} = \frac{17}{12}$ or $1\frac{5}{12}$

Example: Devin walks $\frac{2}{3}$ of a km to a friend's house, $\frac{1}{4}$ km to a park, and $\frac{1}{2}$ km home. What is the total distance that Devin covers?

4. **Check**

- $\frac{8}{12}$ km + $\frac{3}{12}$ km = $\frac{11}{12}$ km

$\frac{17}{12}$ km - $\frac{11}{12}$ km = $\frac{6}{12}$ km or $\frac{1}{2}$ km

km + $\frac{1}{2}$ km = N

Devin covers a total distance of $1\frac{5}{12}$ km.

Non-routine problems, on the other hand, need you to think, work with formulas, or do some analysis. These problems can often be solved in different ways and encourage group discussions to find the right answer.

Example: Mother prepared 3 cakes for the birthday party. She keeps $\frac{1}{2}$ for the family and brought the rest to the celebration. After the party, there was $\frac{3}{4}$ cake left. How many of the cakes were eaten?

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1. **Understand**

   a. What are the given facts?

   - 3 cakes for the birthday party
   - $\frac{1}{2}$ cake for the family
   - $\frac{3}{4}$ cake left

   b. What is asked?

   - How many cakes were eaten?

Example: Devin walks $\frac{2}{3}$ of a km to a friend's house, $\frac{1}{4}$ km to a park, and $\frac{1}{2}$ km home. What is the total distance that Devin covers?

2. **Plan**

   a. What is the operation to be used?

      - Addition and Subtraction

   b. Number sentence?

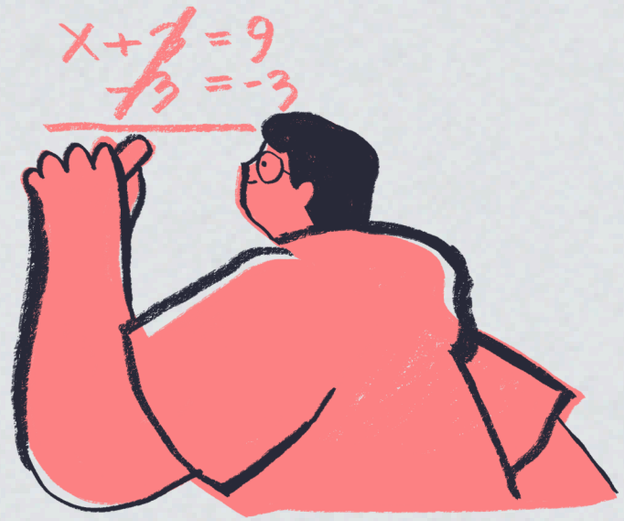
      - $3 - (\frac{1}{2} + \frac{3}{4}) = N$

Example: Devin walks $\frac{2}{3}$ of a km to a friend's house, $\frac{1}{4}$ km to a park, and $\frac{1}{2}$ km home. What is the total distance that Devin covers?

3. **Solve the problem**

- $\frac{1}{2} + \frac{3}{4} = \frac{4+6}{8} = \frac{10}{8} = 1\frac{2}{8}$ or $1\frac{1}{4}$

$$3 = 2\frac{4}{4} - 1\frac{1}{4} = 1\frac{3}{4}$$



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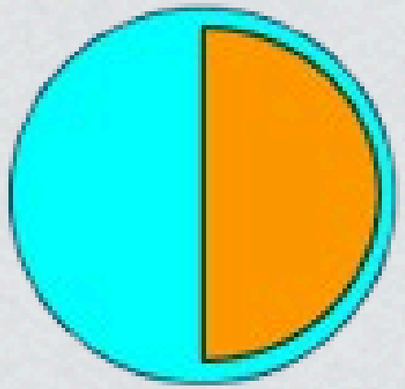
3. **Solve the problem**

$\frac{1}{2}$ keeps for the family



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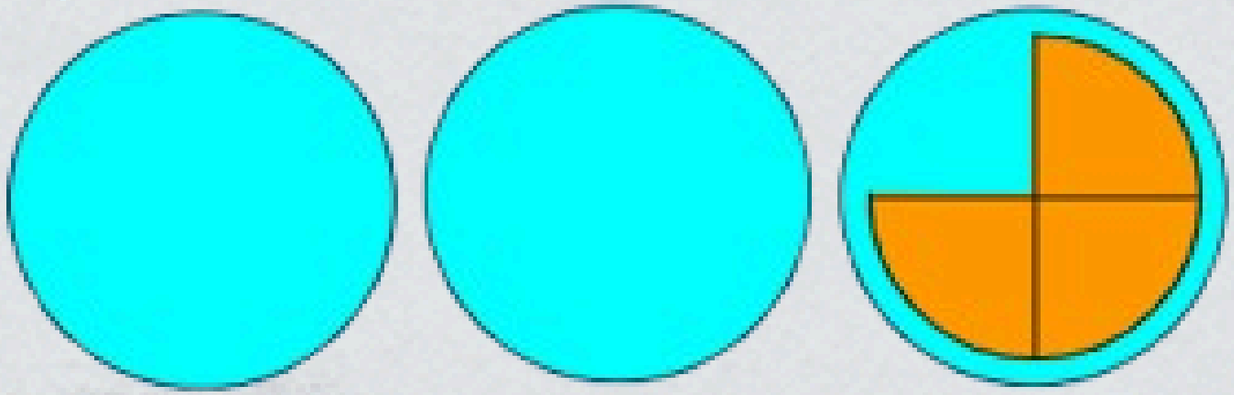
3. **Solve the problem**

$\frac{3}{4}$ cake left



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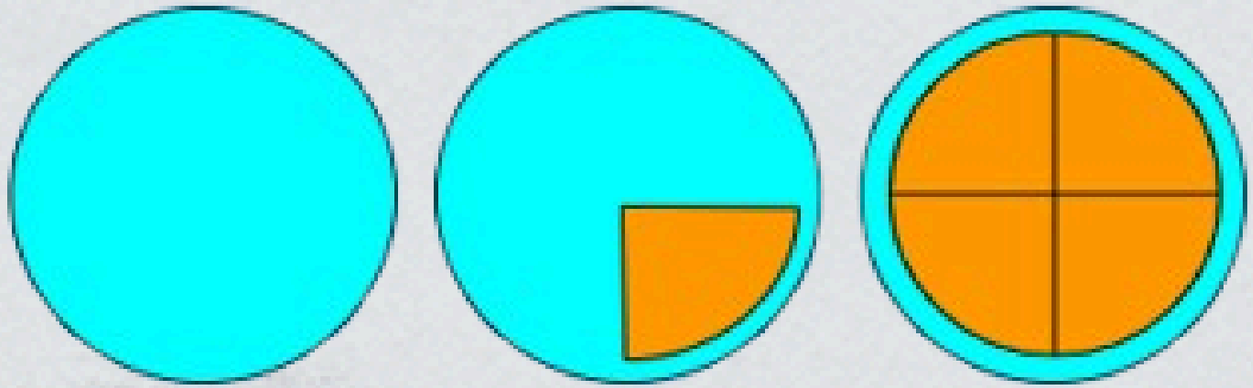
3. **Solve the problem**

Add the cake Mother keeps.



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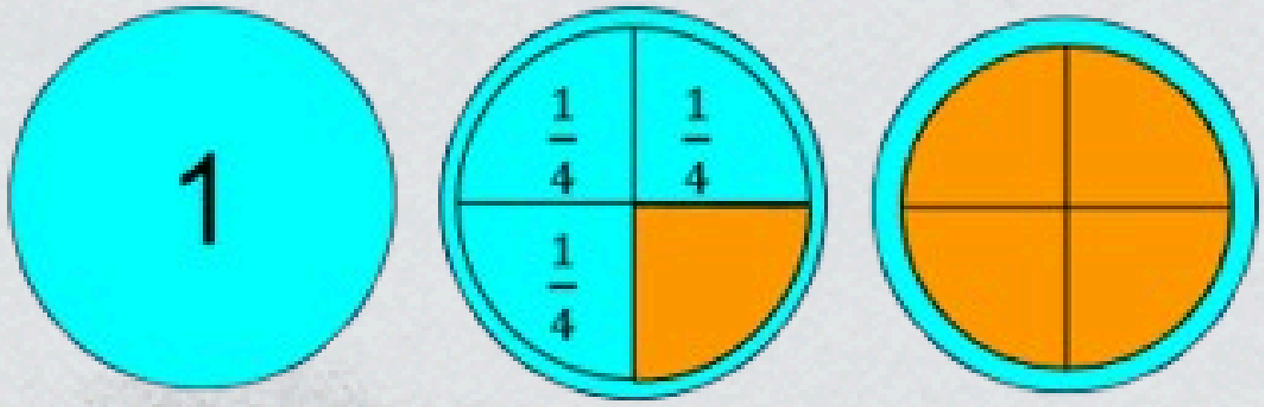
3. **Solve the problem**

$1\frac{3}{4}$ cakes were eaten.



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4. **Check**

$$1\frac{1}{4} \text{ cake} + 1\frac{3}{4} \text{ cake} = 2\frac{4}{4} = 3$$

$1\frac{3}{4}$ **cakes were eaten.**