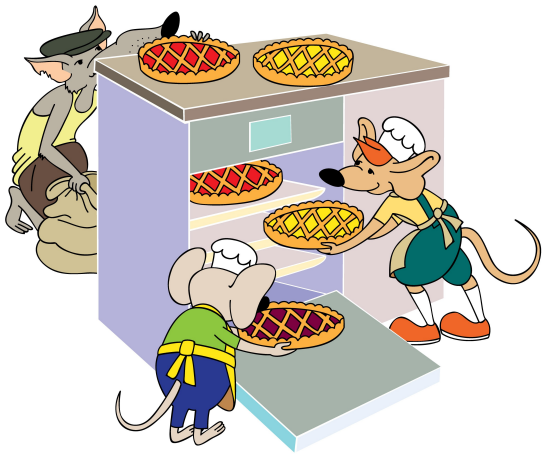
Lesson № 27

1 *Little Joe and Foxy Tail need to prepare 180 pies for an upcoming celebration. They make 20 pies at a time in an old oven. Greedy Rat found a way to get into the oven from behind and is stealing 5 pies from each batch.*



a). How many batches would the mice need to bake if they could keep Greedy Rat away?

_____

b). How many pies from each batch are remaining for the mice?

_____

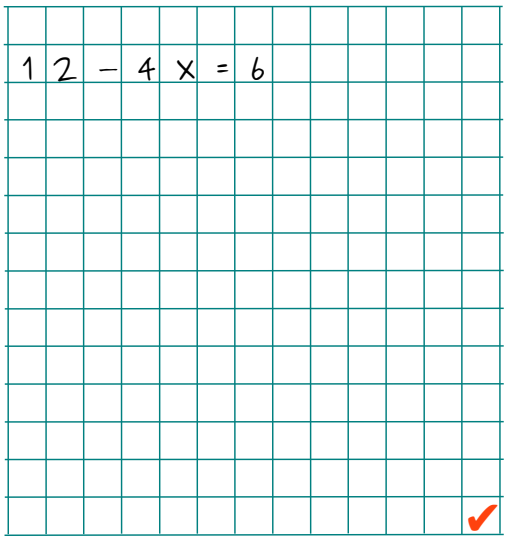
c). How many batches do the brothers need to make to accumulate the needed pies?

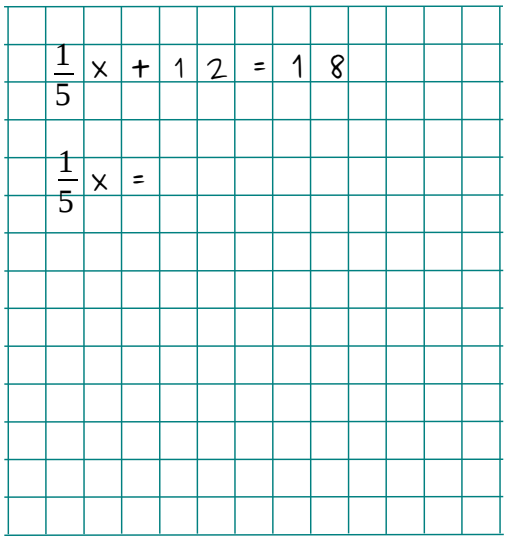
_____

d). How many batch would they need in a new rat-proof oven that can bake 50 pies at a time?

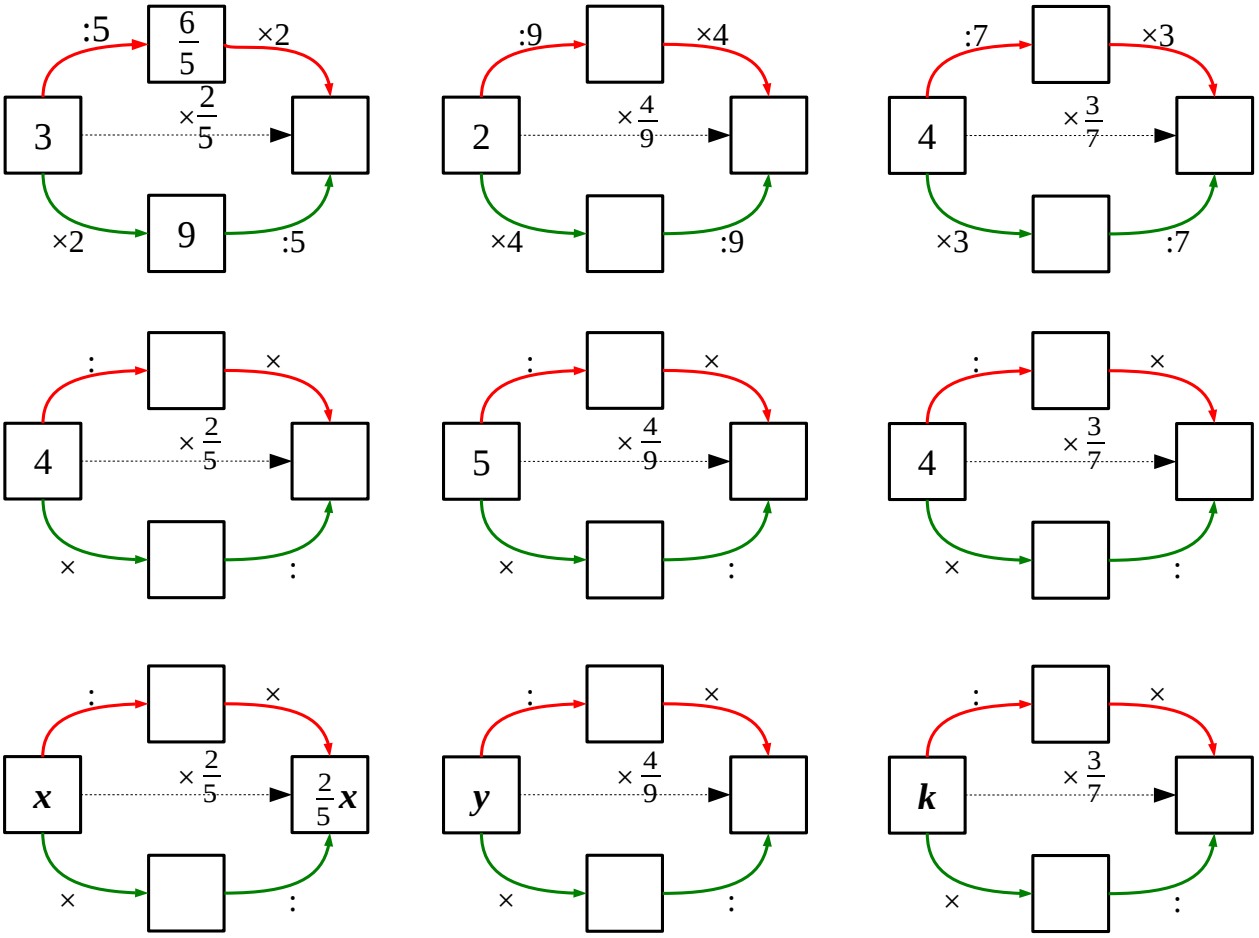
_____

2 Solve the equations





3 Calculate fractions of whole numbers in two different ways:



$5 \times \frac{3}{4} = \quad 5 \times \square : \square =$

$12 \times \frac{3}{4} = \quad 12 : \square \times \square =$

4 Solve equations:

$\frac{3}{4}x = 18$

$x : 4 \times 3 = 18$

$x = 18 : 3 \times$

$x =$

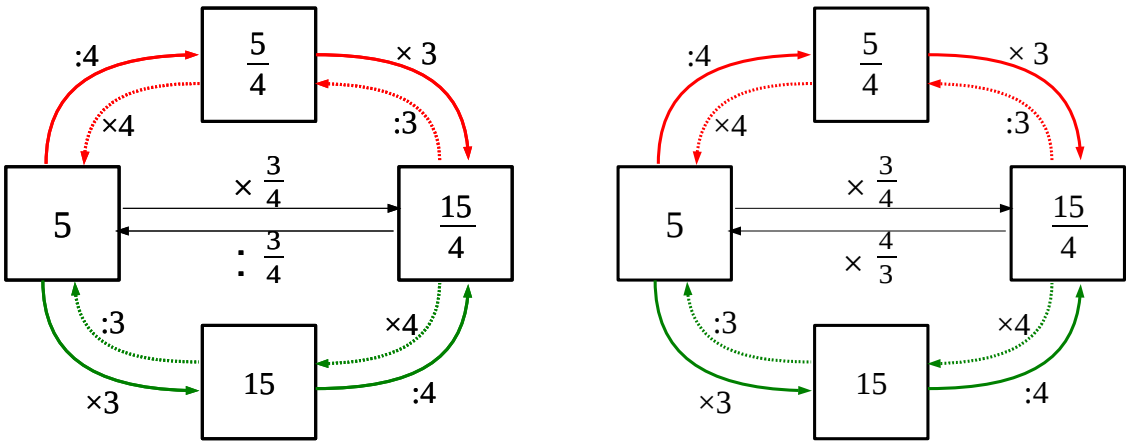
✔

$\frac{5}{7}w = 15$

$w : \quad \times \quad = 15$

$w =$

✔



Dividing a number by a fraction $\frac{m}{n}$ is equivalent to multiplying this number by the inverse fraction $\frac{n}{m}$.

5 Calculate:

$3 : \frac{2}{3} = 3 \times \frac{\square}{\square} =$ $\quad$ $4 : \frac{2}{5} = 4 \times \frac{\square}{\square} =$ $\quad$ $5 : \frac{3}{4} = 5 \times \frac{\square}{\square} =$

$3 : \frac{1}{3} = 3 \times \frac{\square}{\square} =$ $\quad$ $7 : \frac{3}{5} = 7 \times \frac{\square}{\square} =$ $\quad$ $4 : \frac{3}{4} = 5 \times \frac{\square}{\square} =$

6 Solve the equations:

First method

$\frac{2}{5}x = 14$

$\frac{1}{5}x =$

$x =$

$x =$

Second method

$\frac{2}{5}x = 14$

$x = 14 : \frac{2}{5}$

$x = 14 : \quad \times$

$x =$

Choose your method

$\frac{3}{7}x = 6$

$x =$

$x =$

$x =$

Adding simplest fractions with unlike denominators: $\frac{1}{n}+\frac{1}{m}$

By transforming fractions into their equivalents any two fractions can be made to have the same denominator!

These transformations can be made in many ways. Let us consider transformation, that is the most obvious but not necessarily the best.

Any two fractions $\frac{1}{m}$ and $\frac{1}{n}$ can be transformed the following way:

$$\frac{1}{m} = \frac{1 \times n}{m \times n} = \frac{n}{m \times n} \qquad \frac{1}{n} = \frac{1 \times m}{m \times n} = \frac{m}{m \times n}$$

In other words, to take two fractions to a common denominator it is sufficient to multiply both factor and denominator of each fraction by the denominator of the other fraction.

Example: $\frac{1}{4} + \frac{1}{5} = \frac{1\times5}{4\times5} + \frac{1\times4}{5\times4} = \frac{5}{20} + \frac{4}{20} = \frac{9}{20}$

Note, multiplication of denominators might not be the optimal strategy.

Example: cross multiplication of denominators for $\frac{1}{6}$ and $\frac{1}{4}$ produces common denominator 24:

$$\frac{1}{6} = \frac{4}{24} \qquad \frac{1}{4} = \frac{6}{24}$$

Easy to see that a smaller denominator 12 is also common for the two fractions:

$$\frac{1}{6} = \frac{2}{12} \qquad \frac{1}{4} = \frac{3}{12}$$

Next year we shall learn how to find the **least common denominator** of any two fractions. For now, however, we shall either guess the best denominator or simply use the "**second best**", which is just the product of the two.

7 Pick a reasonable common denominator for every pair of fractions to calculate the sums and differences:

$\frac{1}{4} + \frac{1}{3} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

$\frac{1}{5} + \frac{1}{2} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

$\frac{1}{8} + \frac{1}{4} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

$\frac{1}{3} + \frac{1}{2} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

$\frac{1}{3} - \frac{1}{6} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

$\frac{1}{8} - \frac{1}{16} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$

8 Calculate:

2 kg + 3 kg =

$\frac{2}{6} + \frac{3}{6} =$

2 cm + 3 cm =

5 dm + 4 dm =

5 min + 4 min =

$\frac{5}{11} + \frac{4}{11} =$

$\frac{4}{9} + \frac{2}{9} =$

4 sec + 2 sec =

4 m + 2 m =

9 Pick a reasonable common denominator for every pair of fractions to calculate

$\frac{1}{4} + \frac{2}{3} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

$\frac{2}{5} + \frac{1}{2} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

$\frac{2}{3} - \frac{1}{6} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

$\frac{3}{8} - \frac{1}{16} = \frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$

10 Calculate:

$\frac{2}{7} + \frac{4}{7} =$

$\frac{2}{7} \times 4 =$

$\frac{1}{n} + \frac{5}{n} =$

$\frac{5}{7} - \frac{4}{14} =$

$\frac{3}{p} \times 4 =$

$* \frac{2}{k} + \frac{5}{k \times 5} =$