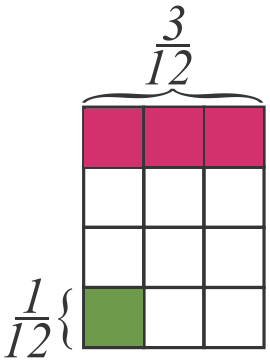
Math 4. Class work 7. **Fractions.**

A fraction represents a part of a whole.

Look at the picture on the right:

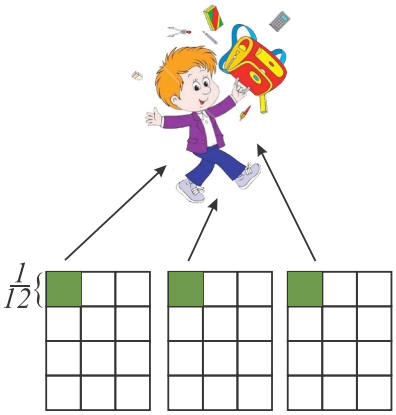


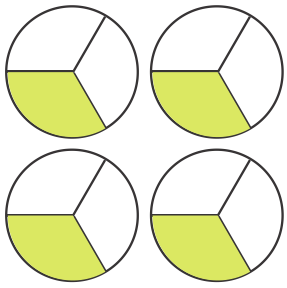
the whole chocolate bar is divided into 12 equal pieces:

$$1\ (whole\ chocolate\ bar\ ) \div 12(equal\ parts)$$
$$= \frac{1\ (whole\ chocolate\ bar\ )}{12(equal\ parts)}$$
$$= \frac{1}{12}(of\ whole\ chocolate\ bar)$$
$$\frac{1}{12} + \frac{1}{12} + \frac{1}{12} = 3 \times \frac{1}{12} = \frac{3}{12} = \frac{1}{4} = 3 \div 12$$

To divide 3 chocolate bars between 12 kids we can give each kid $\frac{1}{12}$ of each chocolate bar, altogether

$$3 \div 12 = 3 \times \frac{1}{12} = \frac{3}{12} = \frac{1}{4}$$

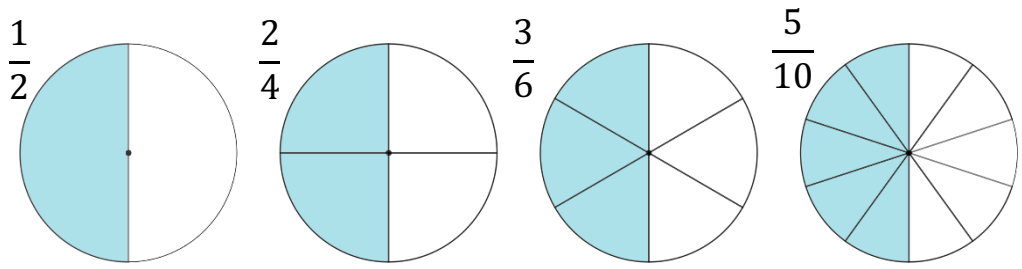




To divide 4 pizzas equally between 3 friends we will give each friend $\frac{1}{3}$ of each pizza. Each friend will get $4 \div 3 = 4 \times \frac{1}{3} = \frac{4}{3}$ which is exactly 1 whole pizza $(3 \times \frac{1}{3} = \frac{3}{3} = 1)$ and $\frac{1}{3}$.

Equivalent fractions.

Some fractions can look different but represent exactly the same part of the whole.



$$\frac{1}{2}=\frac{2}{4}=\frac{3}{6}=\frac{5}{10} \qquad \frac{1}{2}=\frac{1\cdot 2}{2\cdot 2}=\frac{1\cdot 3}{2\cdot 3}=\frac{1\cdot 5}{2\cdot 5}$$

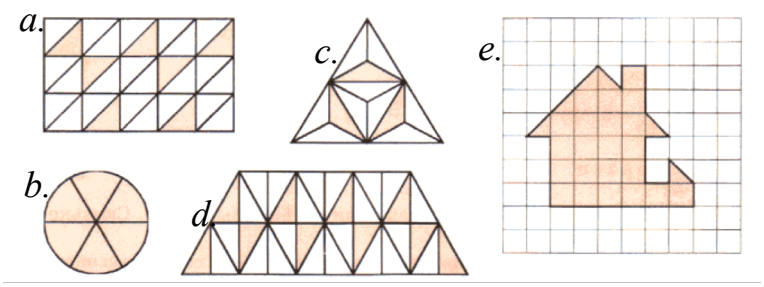
We can multiply the numerator and denominator of a fraction by the same number (not equal to 0), fraction will not change, it's still the same part of the whole. We're dividing the whole into smaller parts and taking more such parts: if parts are twice smaller (denominator is multiplied by 2), we need twice more such parts to keep the fraction the same (numerator is multiplied by 2).

This property of fractions can be used **to reduce fractions.** If there are common factors in numerator and denominator, both numbers can be divided by common factors.

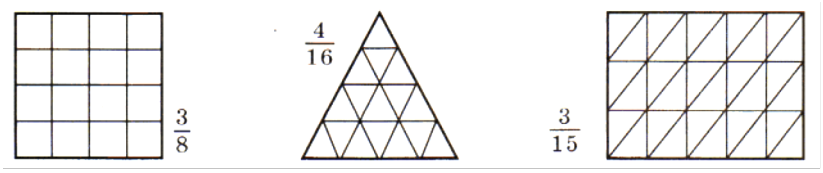
$$\frac{25}{35}=\frac{5\cdot 5}{7\cdot 5}=\frac{5}{7}; \qquad \frac{77}{352}=\frac{7\cdot 11}{32\cdot 11}=\frac{7}{32}$$

Homework

1. Write a fraction which show the shaded part of the shape:



2. Shade the corresponding part of the figure:

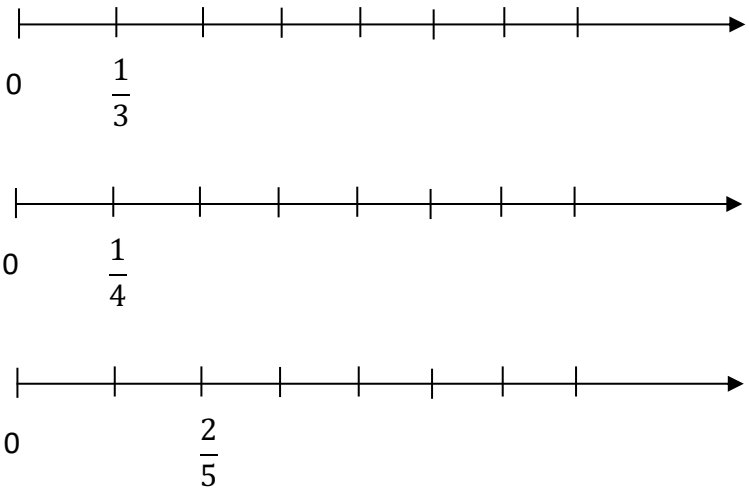


3. Compare:

$\frac{3}{5}$ $\frac{2}{5}$ $\quad$ $\frac{3}{5}$ $\frac{3}{8}$ $\quad$ $\frac{3}{6}$ $\frac{1}{2}$

$\frac{1}{5}$ $\frac{5}{1}$ $\quad$ $\frac{4}{12}$ $\frac{3}{4}$ $\quad$ $\frac{2}{12}$ $\frac{1}{12}$

4. On the number lines below, mark the number 1.



5. An apple worm was eating an apple. On the first day it ate half of the apple, on the second day it ate half of the rest, and on the third day it ate half of the rest again. On the fours day it ate all the leftovers. What part of the apple did it eat on the fourth day?

6. Compute in the most convenient way (Hint: use distributive property)

   a) $13 \times 15 + 87 \times 15$

   b) $177 \times 6 - 77 \times 6$

   c) $20 \times (100 + 2)$

   d) $(100 + 7) \times 8$

7. Copy and complete the following (Hint: remember equivalent fractions):

$a) \frac{2}{4} = \frac{\quad}{2}$ $\quad b) \frac{12}{15} = \frac{\quad}{5}$ $\quad c) \frac{5}{30} = \frac{\quad}{6}$ $\quad d) \frac{21}{49} = \frac{\quad}{7}$

8. Spoons are sold 10 pieces per pack, forks - 12 pieces per pack. You want to have the same number of knives and forks for a party.
   a) what is the least number of packages of knives you need to buy?
   b) what is the least number of packages of forks you need to buy?

9. Big rectangle contains 9 squares. The side of red square is 1 unit; the side of blue square is 7 units. Find sides of all other squares and the sides of the big rectangle.