



*Mary can eat her birthday cake in 10 minutes, and Peter can eat the same cake in 15 minutes. How fast will they eat the same cake together?*

These kinds of problems are related to the amount of work done per unit of time; we can call it “rate”. To solve the problem, we must find out what part of the cake Mary will eat in 1 minute. If she can eat the whole cake in 10 minutes, she only eats  $\frac{1}{10}$  of the cake in one minute. Peter will eat  $\frac{1}{15}$  of the cake in 1 minute. If they start eating the cake simultaneously, each minute

$$\frac{1}{10} + \frac{1}{15} = \frac{3}{30} + \frac{2}{30} = \frac{5}{30} = \frac{1}{6}$$

will be eaten. We don’t know how many minutes are needed, but the rate with which the cake will be disappearing is  $\frac{1}{6}$  per minute:

$$x(\text{minutes}) \cdot \frac{1}{6}(\text{part of the cake}) = 1(\text{whole cake})$$

So, they will need exactly

$$x = 1(\text{whole cake}) : \frac{1}{6}(\text{parts}) = 1 \cdot 6 = 6 \text{ minutes}$$

### **Homework:**

1. Two pedestrians left simultaneously from two villages towards each other. One pedestrian can cover the entire distance in 3 hours, and the other in 6 hours. In how many hours will they meet?
2. A serving of fruit ice cream weighing 25 g contains 0.001 g of vitamin C. The daily requirement of the body for this vitamin is 0.075 g. Is it enough to eat 1 kg of ice cream per day to meet the body's daily vitamin C requirement?

3. Compare (which one is greater) by representing fractions as decimals:

d.  $0.75$  and  $\frac{3}{4}$ ;      e.  $\frac{7}{20}$  and  $0.35$ ;      f.  $\frac{1}{125}$  and  $0.01$ ;

4. Compare by representing decimals as fractions:

d.  $0.1$  and  $\frac{1}{9}$ ;      e.  $\frac{5}{7}$  and  $0.7$ ;      f.  $0.8$  and  $\frac{5}{6}$ ;

5. A farmer has a cow, a goat, and a goose. The cow and the goat will eat all the grass on his meadow in 45 days, the cow and the goose will eat all the grass on the same meadow in 60 days, and the goat and the goose will eat all the grass on the meadow in 90 days. How many days will it take them altogether to eat all the grass on the meadow? (We assume that new grass is not growing.)

