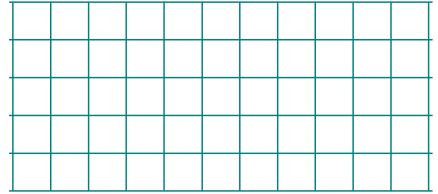


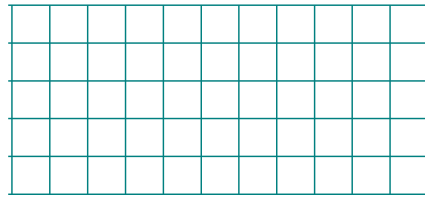
Lesson № 22

1 Solve the word problems:

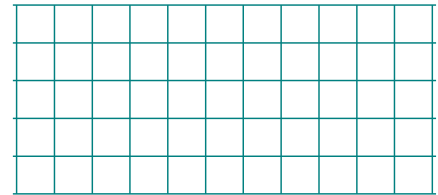
A. A robot spent 3 hours to make 6 sets of chess pieces. How long will it take the robot to make 17 such sets?



B. It takes a raft 6 hours to drift every 18 km downstream. How long will it take the raft to drift 24 km?



C. There were 18 apples and 24 oranges in a bag. Katie took $\frac{1}{3}$ of those apples and $\frac{1}{4}$ of the oranges. How many fruit did she take?



2 Solve equations:

$$80 : (x - 2) = 8$$

$$80 : x - 2 = 8$$

General fraction $\frac{m}{n}$.

3 Calculate:

$$1 \text{ cm} + 1 \text{ cm} = \quad 1 \text{ m} + 1 \text{ m} = \quad \frac{1}{7} + \frac{1}{7} = \quad \frac{1}{n} + \frac{1}{n} =$$

$$1 \text{ cm} \times 3 = \quad 1 \text{ m} \times 3 = \quad \frac{1}{7} \times 3 = \quad \frac{1}{n} \times 3 =$$

A fraction $\frac{1}{n}$ represents a unit broken into n equal parts.

A fraction $\frac{m}{n}$ represents m fractions $\frac{1}{n}$ added together:

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

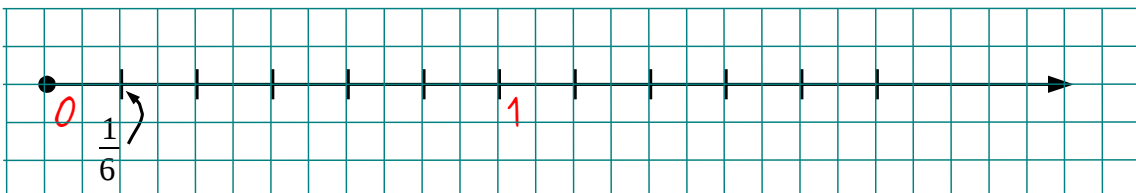
4 Calculate:

$$3 \text{ cm} + 5 \text{ cm} = \quad 2 \text{ dm} + 6 \text{ dm} = \quad \frac{2}{9} + \frac{5}{9} = \quad \frac{2}{n} + \frac{5}{n} =$$

$$3 \text{ cm} \times 5 = \quad 2 \text{ m} \times 7 = \quad \frac{1}{11} \times 4 = \quad \frac{1}{n} \times 9 =$$

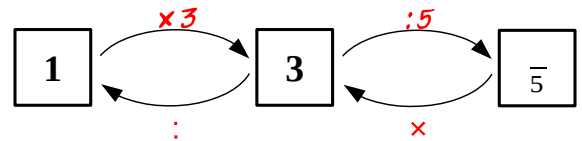
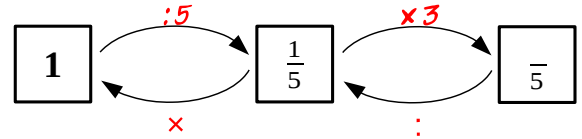
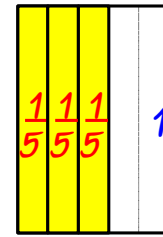
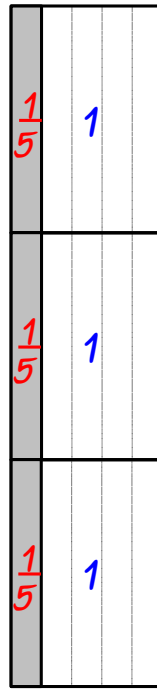
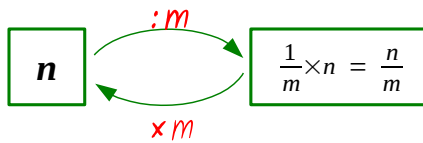
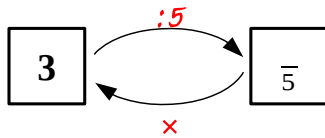
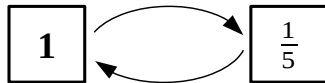
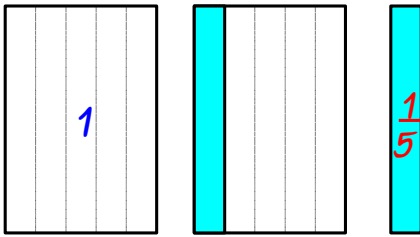
5 Label the following fractions on the number line: $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{12}$, $\frac{5}{12}$,

$$\frac{3}{4}, 1\frac{1}{2}, 1\frac{3}{12}, \frac{2}{3}$$



6

Compare the yellow (Y) and the gray (G) areas on the drawing:

Y G

The yellow and the gray rectangles have the same area but different shape.

These shapes illustrate two ways of making a fraction $\frac{m}{n}$:

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

7

Fill in the blanks:

$$\frac{1}{5} \times 3 = \frac{3}{5} = 3 : 5$$

$$\square \times 4 = \frac{4}{7} = \square : \square$$

$$\frac{1}{9} \times \square = \frac{7}{9} = 7 : \square$$

$$\square \times 5 = \frac{5}{6} = 5 : \square$$

$$\frac{1}{8} \times 3 = \frac{\square}{\square} = \square : \square$$

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

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

$$\frac{\square}{5} \times 2 = \frac{2}{5} = 2 : \square$$

$$\frac{1}{8} \times 5 = \frac{\square}{\square} = 5 : \square$$

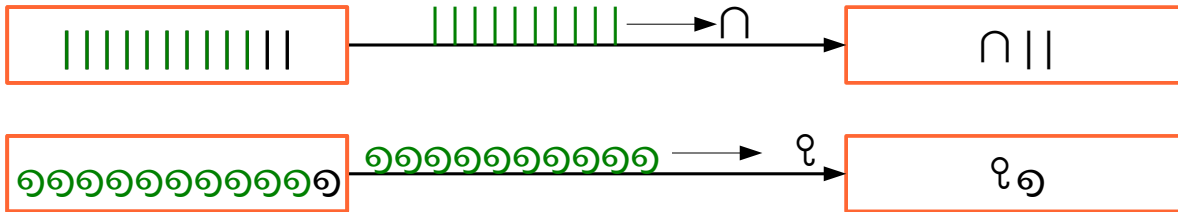
8 Addition and subtraction in ancient Egyptian symbols is similar to what they are in our numerical system.

Sometimes you have to regroup.

For example:

$$\begin{array}{r}
 + \quad \text{☉☉☉☉} \quad \text{∩∩} \quad ||||| \\
 \text{☉☉☉☉} \quad \text{∩} \quad |||| \\
 \hline
 \text{☉☉☉☉☉☉☉☉} \quad \text{∩∩∩} \\
 \quad \quad \quad |||||
 \end{array}$$

Number	Symbol	Description
1		Vertical stroke
10	∩	Heel bone
100	☉	Scroll
1000	☪	Lotus flower
10,000	☞	Pointing finger
100,000	☩	Fish
1,000,000	☎	Kneeling person



The answer is 11 hundreds, 3 tens, and 12 units.

Instead of 12 units we want to have 2 units and 1 ten.

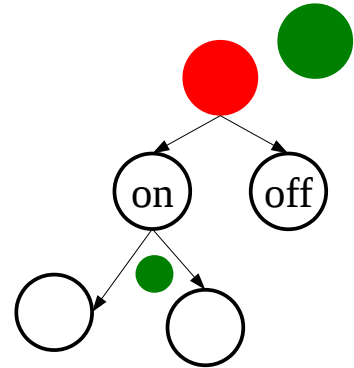
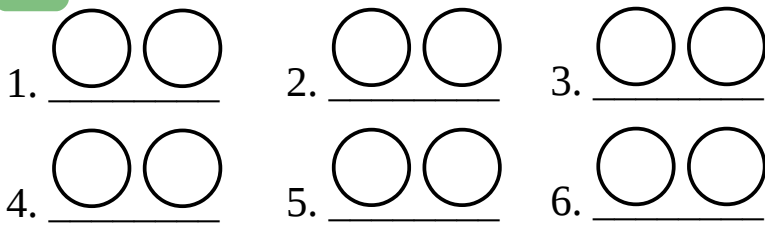
Also, instead of 11 hundreds we want to have 1 thousand and 2 hundreds.

So the answer is really: ☪∩∩∩∩ ||.

Calculate in Egyptian:

$$\begin{array}{r}
 \text{☞☞☞} \quad \text{∩} \quad ||||| \\
 + \text{☞} \quad \text{∩∩} \quad ||||| \\
 \hline
 \end{array}
 \qquad
 \begin{array}{r}
 \text{☞☞} \\
 + \text{☪} \quad \text{☉☉} \quad \text{∩} \quad || \\
 \hline
 \end{array}$$

9 How many are there different ways to switch on/ off two light bulbs?



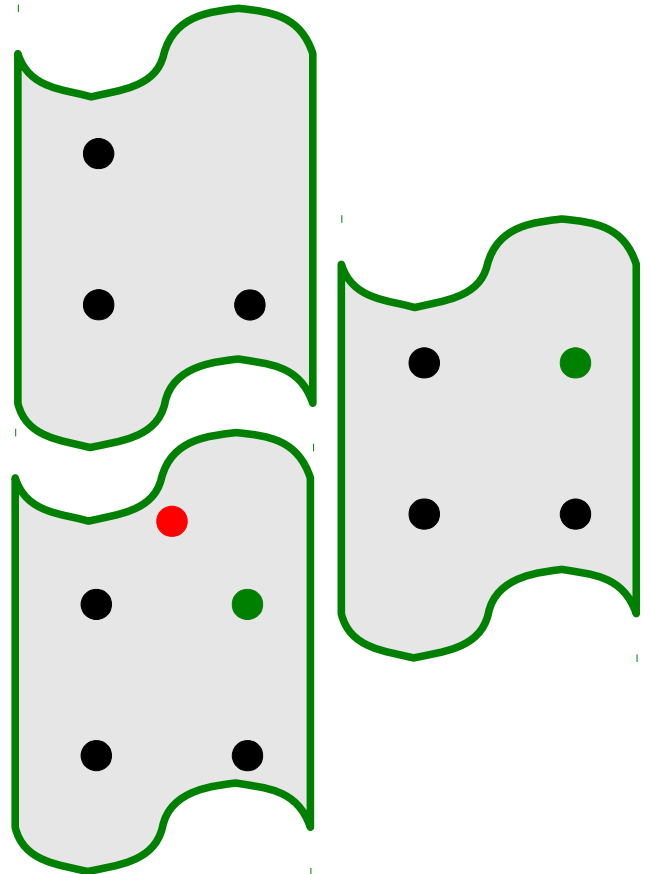
How many different ways did you find? _____

10 Complete graphs to answer the questions:

A. Three players have to play a group chess tournament. Each player must have a game with another one. How many games will be played?

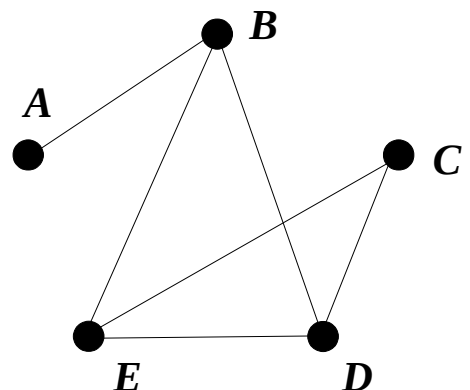
B. Four players have to play a group chess tournament. Each player must have a game with another one. How many games will be played?

C. Five players have to play a group chess tournament. Each player must have a game with another one. How many games will be played?



10 The following bus services connecting towns A, B, C, D, and E are available in both directions:

- | | |
|----------------|----------------|
| 1. A – B : \$5 | 2. D – C : \$7 |
| 3. B – E : \$4 | 4. B – D : \$5 |
| 5. D – E : \$4 | 6. C – E : 6 |



What is the cheapest way from A to C?

