Classwork 18

school nova™

Work problems (combined labor problems).

Mary can eat her birthday cake in 10 minutes. Peter can eat the same cake in 15 minutes, how fast they will 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 have to 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 will 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 $\frac{1}{6}$ per minute:

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

So, they will need exactly

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

Homework

1. Evaluate. (Hint: both numbers should be written in the same fractional or decimal representation, depending on which one is most convenient for the problem.)
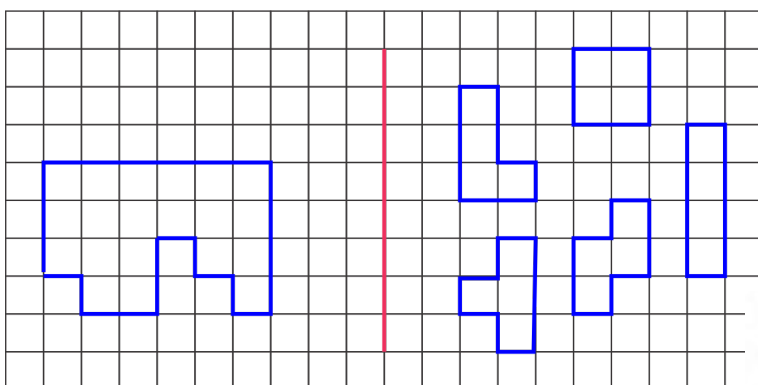
Example

$$1\frac{4}{5} + 3.755 = 1\frac{8}{10} + 3.755 = 1.8 + 3.755 = 5.555$$

$$42.14 \cdot 1\frac{3}{7} = \frac{4214}{100} \cdot \frac{10}{7} = \frac{602 \cdot 7 \cdot 10}{100 \cdot 7} = \frac{602}{10} = 60.2$$
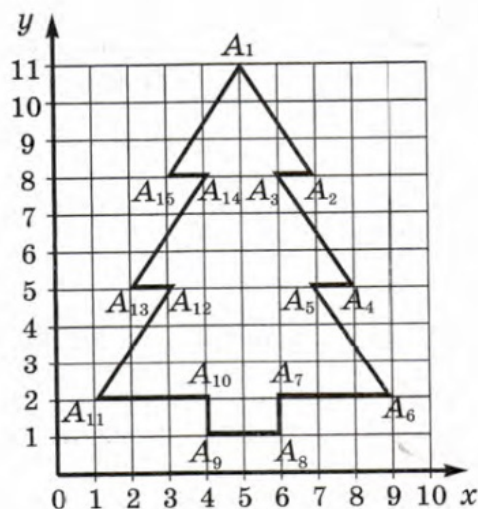
a. $7\frac{8}{10} - 2.5$ b. $0.7 \cdot \frac{1}{7}$ c. $\frac{1}{4} + 2.25$ d. $\frac{1}{8} \cdot 125$

2. Create the shape on the left using the 5 shapes on the right.

3. Write the coordinates of the points on the picture:

Example: $A_1(5,11)$

4. The older brother can clean up the room in 2 hours, the younger brother can completely ruin it in 3 hours. In how many hours will the room be cleaned if they are locked together in the messy room? (it's a math problem, the answer "they will play games" will not be accepted!)

5. 60 kids took part in the swimming meets. There were three times as many girls as boys. How many boys and how many girls competed? Write an equation and solve it.

6. The sum of numbers a and b equal to 7. What would be the value of
$$5 \cdot a + 5 \cdot b?$$

7. Copy the figures to a graph paper:
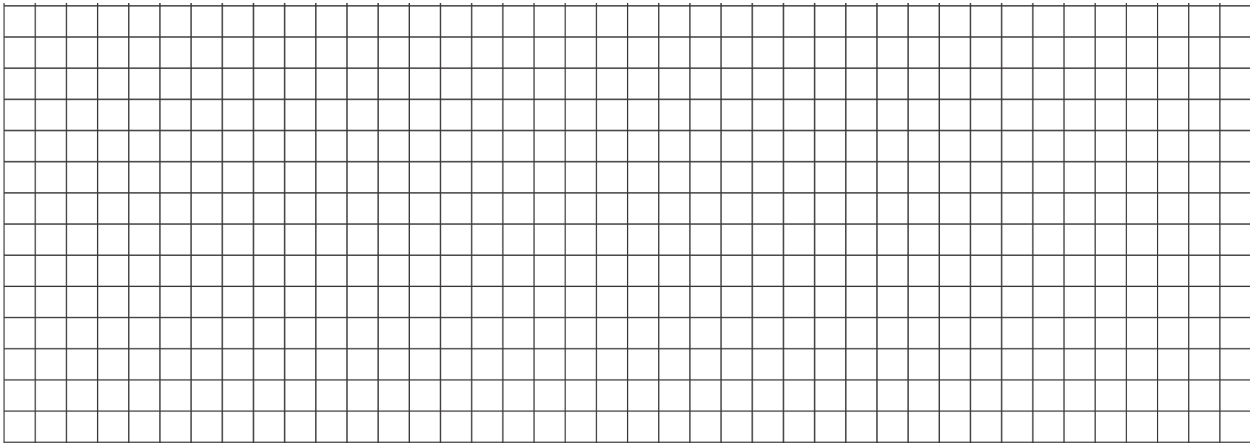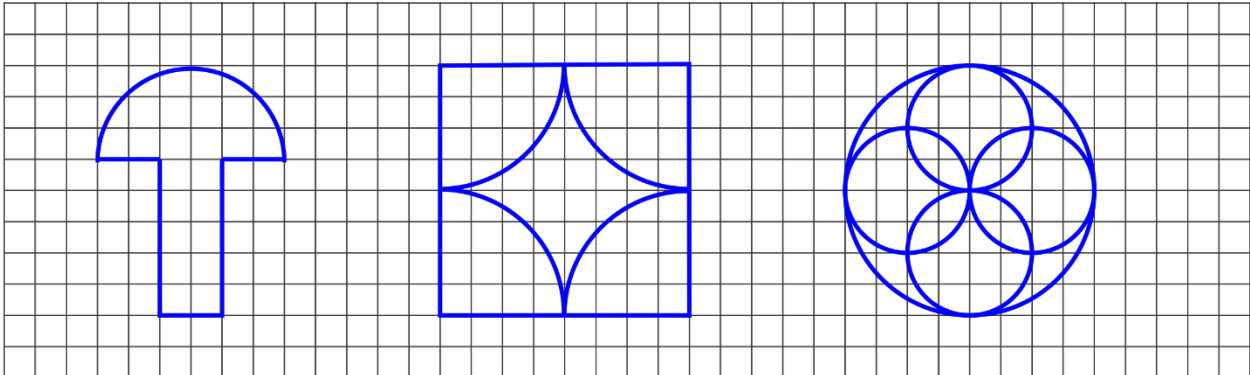
8. Mother is twice as old as her daughter. Father is 5 years older then mother. Together they are 120 years old. How old is father?