Algebra and Geometry 1. Homework 9.

Algebra.

1. Dry cranberries contain 25% of water. How much water should be evaporated from 5 kg of fresh cranberries to get dry cranberries, if fresh cranberries contain 85% of water?

2. A notebook costs 3 dollars. How much do I need to pay if I am buying 3 notebooks, 5, 12? What variables are used, what is the relationship between them? Can a constant of proportionality be found?

3. Solve the following equations (hint: use proportionality)

$$\frac{x-\frac{2}{7}}{\frac{2}{7}}=\frac{48.3}{0.7};\qquad \frac{1.8}{6.8}=\frac{0.042}{1\frac{1}{6}x+0.042}$$

4. The relationship between the two variables is given in the table below. Is this relationship proportional? If so, what is the constant of proportionality? Is some of these relationships inverse proportionality?

a.

x	9	15	33	45	66
y	3	5	11	15	22

b.

x	3	2	5	4	6
y	9	4	25	16	36

c.

x	3	2	1	$\frac{1}{3}$	30
y	1	$\frac{3}{2}$	3	9	0.1

3. Are the following variables proportional?
   a. Speed and time of movement on a distance of 50 km.
   b. Speed and the distance traveled in 2 hours of driving.
   c. Price of the 1 notebook and the number of notebooks that can be bought with 24 dollars.
   d. Length and width of the rectangle with the area of 60 cm^2.
4. A car travels 60 km during a certain time. How will time of travel change, if the speed is increased 3 times?
5. Which of the following formulas describe the direct proportionality, inverse proportionality, neither of the two?

$$P = 5.2b; \quad K = \frac{n}{2}; \quad a = \frac{8}{b}; M \quad = m{:}\,5; \quad G = \frac{1}{4k};$$
$$a = 8q + 1; \quad c = 4{:}\,d, \quad 300 = v \cdot t; \quad ab = 18; \quad S = a^2$$

6. Peter's time of driving to work is usually 1 hour and 20 minutes. Yesterday the weather was bad and Peter reduced his speed by 10 km/h and reached his work in 1.5 hours. What is the distance between Peter's work and his house?
7. In a driving school, a car with an instructor and three students went to the ride. The instructor drove $\frac{2}{15}$ of the whole distance and 5 km, two students drove $\frac{1}{4}$ of the distance each, and the third students drove the remaining 105 km. What was the length of the whole itinerary?

Geometry.

8. Legs of a right triangle are 3 cm and 4 cm. What is the length of its hypotenuse?
9. The perimeter of a given triangle is 36 cm. The lengths of the sides are in ratio 2:3:4. What are the lengths of all sides? Draw the triangle with these sides.
10. Find the length of the altitude AH in triangle ABC (see Figure). The side of each square cell is 1.