A student read a 480-page book. Every day, he read the same number of

pages. If he had read 8 pages more every day, he would have finished the

book 3 days earlier. Calculate how many days the student took to read the

whole book.

A gardener is planning to plant a certain number of fruit bushes. If each

bush produces 2.4kg of fruit, and 1kg of fruit yields 0.75 litres of juice,

how many bushes must he plant in order to produce 900 bottles of juice,

each with a volume of 0.7 litres?

A car travels 210km in a certain amount of time. If the car had travelled

with an average speed of 10km/h more than it actually did, its travelling

time would be shorter by half an hour. Calculate the car's average

speed.

Two freight trains left from cities A and B, located 540km apart. The train

travelling from city A to city B left an hour earlier than the train

travelling from city B to city A, and it travelled with a speed 9km/h

slower. The trains passed each other at the halfway point between the two

cities. Calculate the speeds of both trains.

One of the roots of the quadratic function f is x=5. The maximum range in

which the function is decreasing is <2, +∞). The largest value of the

function f in the range <-8, -7> is equal to -24. Solve f for x, and

plot its curve.

Solve the quadratic function f, whose shape is a parabola with its vertex

at (2, -8). Show this function in canonical form. Calculate its roots and

sketch its curve.

A square has sides of length a. In the rectangle ABCD, the side AB is 2

times longer than a, and the side AD is 2cm shorter than a. The area of

the rectangle is 12 square centimetres greater than the area of the square.

Calculate a.

Calculate the perimeter of a right-angled triangle, whose incircle is

tangential to the hypotenuse at the point which divides the hypotenuse into

parts of length 5 and 12.

A shop selling sportswear sells 16 hooded tops every day. The profit from

the sale of one item is 40 zł. The shop's owner predicts that every 5

zł reduction in price will lead to the sale of 4 more items per day. By

how much should the shop's owner reduce the price to ensure the

maximum profit?

The owner of a cinema notices that by setting the price of a ticket at 16

zł, he can expect on average 100 customers, while every 1 zł increase in

price leads to 5 fewer customers. What ticket price should he set, so that

the cinema's profits are maximised?

1. Rectangular isosceles triangles ABC and CDE are located in a way shown below (both triangles are right-angled in the corner C). Show that AD=BE.



1. During holidays Adam travelled by bicycle at a steady speed a distance of 120km from town A to town B. If he had ridden his bicycle at an average speed of 5km/h faster, it would have taken him to travel the same distance
2 hours less. Show Adam's average actual speed and actual travel time.
2. There is a ceratin amount of water in two containers. If one poured 5cm³ of water from one container into the sink, the water in this container would constitute half of water which the other container contains. If one poured 10cm³ of water from the second container into the first one, then the amount of water in both containers would be the same. How much cm³ is there in these two containers?
3. Quadratic function *f* determined by the formula *f(x)=ax²+bx+c.* The set of solution to the inequality *f(x)>0* is (0,12). The largest value of function *f* is equal to 9. Calculate the rates *a,b* and *c* of the function *f*.
4. In an isosceles trapezoid a diagonal is of lenght *d* and creates with the longer base an angle of the measurement *α.* Calculate the trapezoidal field of this trapezoid.