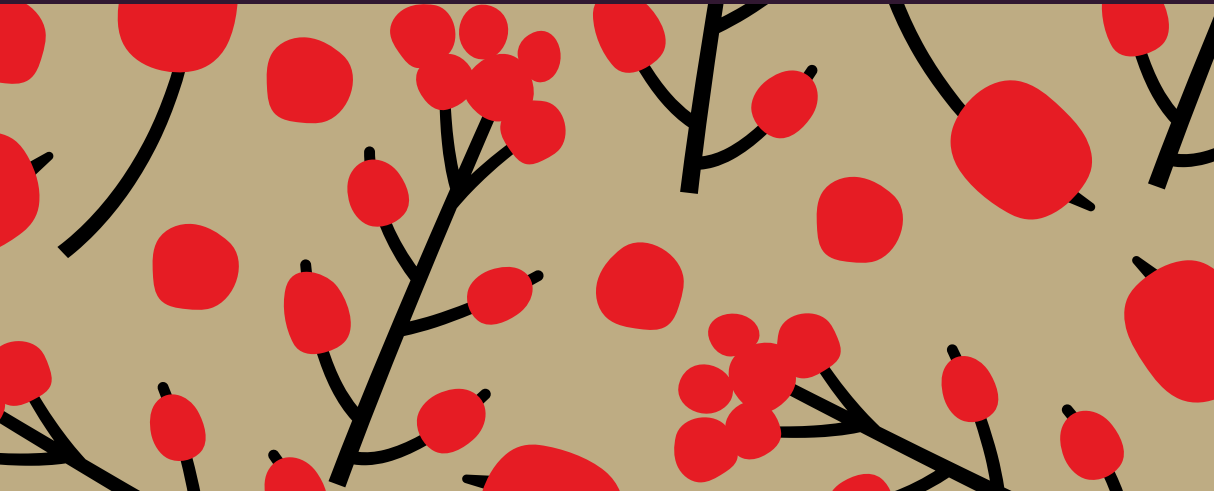
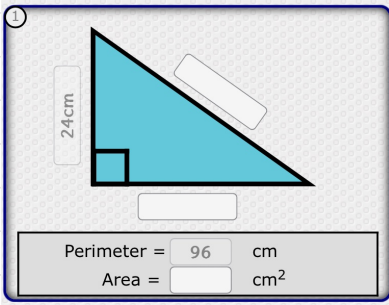




# PYTHAGOREAN PROBE

LEVEL 4





This is an example of one method of solving this type of problem.

The number used in the online exercise are randomly chosen so will be different in many cases.

Let the base be  $x$ .

The hypotenuse will be  $\sqrt{24^2 + x^2}$

The perimeter is:

$$24 + x + \sqrt{24^2 + x^2} = 96$$

$$\sqrt{24^2 + x^2} = 72 - x$$

$$24^2 + x^2 = 72^2 - 144x + x^2$$

$$144x = 72^2 - 24^2$$

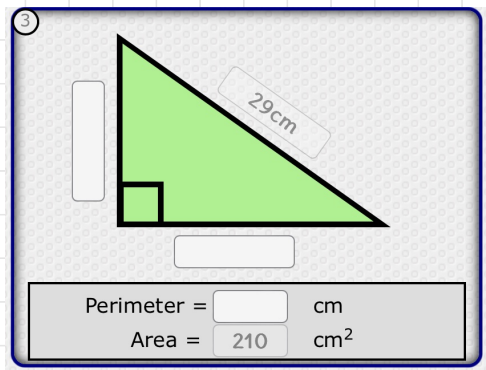
$$x = \underline{\underline{32}} \text{ cm}$$

$$\therefore \text{Hypotenuse} = \sqrt{24^2 + 32^2} = \underline{\underline{40}} \text{ cm}$$

$$\text{Area} = \frac{1}{2} 24 \times 32 = \underline{\underline{384}} \text{ cm}^2$$

This is an example of one method of solving this type of problem.

The number used in the online exercise are randomly chosen so will be different in many cases.



Let the base be  $x$

The height is  $\sqrt{29^2 - x^2}$

The area is  $\frac{1}{2} x \sqrt{29^2 - x^2} = 210$

$$\sqrt{29^2 - x^2} = \frac{420}{x}$$

$$29^2 - x^2 = \frac{420^2}{x^2}$$

$$29^2 x^2 - x^4 - 420^2 = 0$$

Let  $y = x^2 \Rightarrow y^2 - 29^2 y + 420^2 = 0$

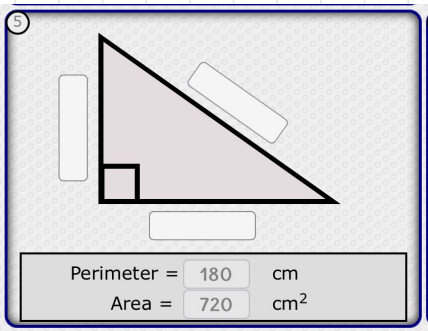
Solving this quadratic on a GDC

$$y = 400 \text{ and } 441 \quad \therefore x = \sqrt{400} = 20$$

$$\text{and } x = \sqrt{441} = 21$$

The height and base are interchangeable so one solution is

height = 20 cm, base = 21 cm, Perimeter = 70 cm



This is an example of one method of solving this type of problem.

The number used in the online exercise are randomly chosen so will be different in many cases.

Let the height be  $x$  and the base be  $y$

$$\text{Area} = \frac{1}{2}xy = 720 \quad \therefore y = \frac{1440}{x}$$

The hypotenuse is  $\sqrt{x^2 + \frac{1440^2}{x^2}}$

$$\text{Perimeter: } 180 = x + \frac{1440}{x} + \sqrt{x^2 + \frac{1440^2}{x^2}}$$

This equation can be solved either by using the GDC's numerical solve function or by plotting a graph(s).

$$x = 18 \quad \therefore y = \frac{1440}{18} = 80$$

$$\text{height} = \underline{\underline{18\text{cm}}}$$

$$\text{base} = \underline{\underline{80\text{cm}}}$$

$$\text{Hypotenuse} = \sqrt{18^2 + \frac{1440^2}{18^2}} = \underline{\underline{82\text{cm}}}$$